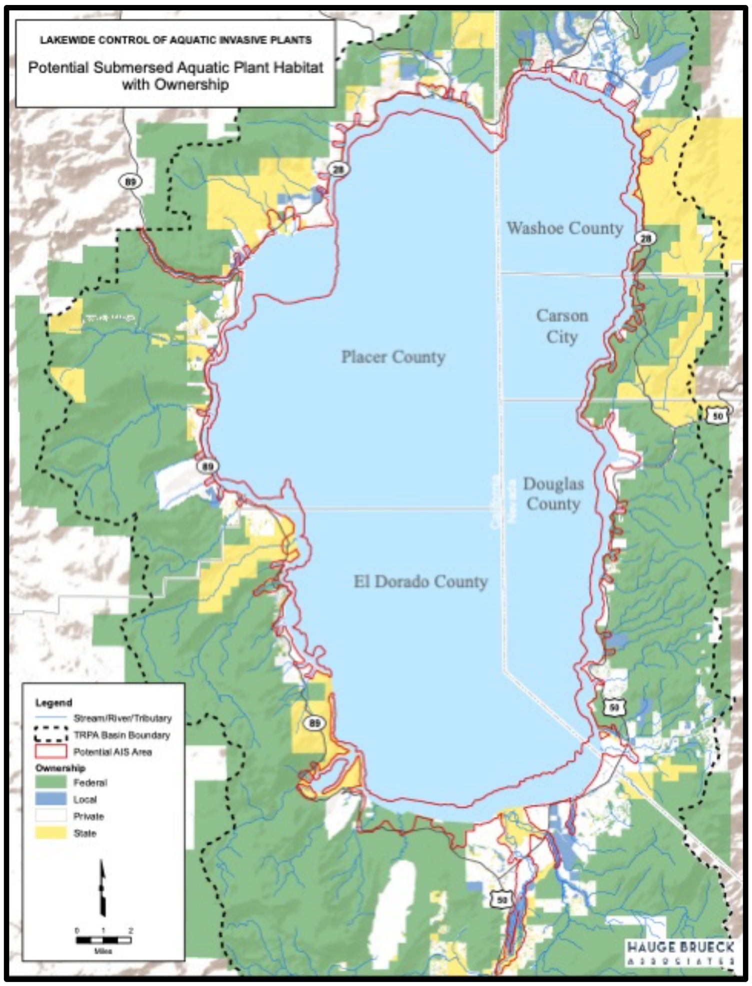
LAKE-WIDE CONTROL OF AQUATIC INVASIVE PLANTS PROJECT
LAKE TAHOE, CALIFORNIA AND NEVADA

CEQA Initial Study / Mitigated Negative Declaration

TRPA Initial Environmental Checklist / Mitigated Finding of No Significant Effect

NEPA Environmental Assessment / Finding of No Significant Impact



Prepared for:
Tahoe Resource Conservation District
Tahoe Regional Planning Agency
USDA Forest Service -
Lake Tahoe Basin Management Unit

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August 2020 (Updated January 2021)

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ACRONYMS

AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
AIS	Aquatic Invasive Species (Plant Species)
AIP	Aquatic Invasive Plants
ALUCP	Airport Land Use Compatibility Plan
APE	Area of Potential Effect
BA	Biological Assessment
Basin Plan	Water Quality Control Plan – Lahontan Region
BE	Biological Evaluation
BMI	Benthic Macroinvertebrate
BMP	Best Management Practice
BWQP	Bureau of Water Quality Protection (NDEP)
CA	California
CAA	Clean Air Act of 1970
CAISMP	California Aquatic Invasive Species Management Plan
CalFire	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act of 1988
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CDPR	California Department of Parks and Recreation
CDTSC	California Department of Toxic Substance Control
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFCs	Chlorofluorocarbons
CGS	California Geological Survey
CH_4	Methane
CLP	Curly-leaf pondweed
CNDDB	California Natural Diversity Database (CDFW)
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
COLD	Cold Freshwater Habitat
CRHR	California Register of Historic Resources
CRS	Cultural Resource Specialist
CSGWPP	Comprehensive State Groundwater Protection Program
CSLC	California State Land Commission
CSLT	City of South Lake Tahoe
CTC	California Tahoe Conservancy
CWA	Clean Water Act
dB	Decibels

dBA	Noise Measurement Expressed in Weighting Frequencies
DNA	Deoxyribonucleic Acid
DIN	Dissolved Inorganic Nitrogen
DTSC	Department of Toxic Substance Control
DVTE	Daily Vehicle Trip Ends
EA	Environmental Assessment
EDCAQMD	El Dorado County Air Quality Management District
EIP	Environmental Improvement Program
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPT	Ephemeroptera Plecoptera Trichoptera
ESA	Endangered Species Act
EWM	Eurasian watermillfoil
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
Forest Plan	LTBMU Land Management Plan
GHG	Greenhouse Gas
GID	General Irrigation District
GWP	Global Warming Potential
HACCP	Hazard Assessment and Critical Control Point
HCFCs	Hydrofluorocarbons
HPM	Heritage Program Manager
IEC	Initial Environmental Checklist
IPCC	Intergovernmental Panel on Climate Change
IS	Initial Study
L_{eq}	Equivalent Sound Level
Lahontan	Lahontan Regional Water Quality Control Board
LCT	Lahontan Cutthroat Trout
League	League to Save Lake Tahoe
LFA	Laminar Flow Aeration
L_{max}	Maximum Sound Level
LOP	Limited Operating Period
LOS	Level of Service
LSA/SAA	Lake and Streambed Alteration Agreement
LSAA	Lake and Streambed Alteration Agreement
LTD	Lake Tahoe Datum
LTAISCC	Lake Tahoe Aquatic Invasive Species Coordinating Committee
LTAISWG	Lake Tahoe Aquatic Invasive Species Working Group
LTBMU	Lake Tahoe Basin Management Unit
MBTA	Migratory Bird Treaty Act
MFONSE	Mitigated Finding of No Significant Effect
MMT	million metric tons
MND	Mitigated Negative Declaration
MUN	Municipal
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NAWWG	Nearshore Aquatic Weed Working Group
N_2O	Nitrous Oxide
NCCP	Natural Community Conservation Plan
NCIC	North-Central Information Center

NDA	Nevada Department of Agriculture
NDEP	Nevada Department of Environmental Protection
NDOW	Nevada Department of Wildlife
NDSL	Nevada Division of State Lands
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Protection Act
NFL	National Forest Lands
NFMA	National Forest Management Act
NFS	National Forest Service
NITC	NRCS National Information Technology Center
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxide
NOAA	National Oceanic Atmosphere Administration
NOC	Notice of Completion
NOD	Notice of Determination
NOI	Notice of Intent
NOT	Notice of Termination
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NTPUD	North Tahoe Public Utility District
NTRT	Nevada Tahoe Resource Team
NTU	Nephelometric Turbidity Units
NVCRIS	Nevada Cultural Resources Information System
NWP	Nationwide Permit
O_3	Ozone
OHP	Office of Historic Resources
Pb	Lead
PCN	Pre-construction Notification
PM_{10}	Particulate Matter with an aerodynamic diameter of 10 Microns or less
$PM_{2.5}$	Particulate Matter with an aerodynamic diameter of 2.5 Microns or less
PRC	Public Resources Code
Project	Lake-wide Aquatic Invasive Plant Control Project
PUD	Public Utility District
RPMs	Resource Protection Measures
SCH	State Clearinghouse
SCUBA	Self Contained Underwater Breathing Apparatus
SEZs	Stream Environment Zones
SHPO	State Historic Preservation Officer
SNPLMA	Southern Nevada Public Lands Management Act
SNYLF	Sierra Nevada Yellow Legged Frog
SO_2	Sulfur Dioxide
SOI	Secretary of the Interior
SQIP	Scenic Quality Improvement Plan
SR	State Route
State Board	California State Water Resources Control Board
SWPPP	Stormwater Pollution Prevention Plan
TART	Tahoe Area Regional Transit
TEPCS	Threatened, Endangered, Proposed, Candidate and Sensitive Species

TMDL	Total Maximum Daily Load
TMPO	Tahoe Metropolitan Planning Organization
TPH	Total Petroleum Hydrocarbon
Tahoe RCD	Tahoe Resource Conservation District
TERC	Tahoe Environmental Research Center
TIIMS	Tahoe Integrated Information Management System
TKPOA	Tahoe Keys Property Owners Association
TRPA	Tahoe Regional Planning Agency
TSC	Tahoe Science Consortium
TWSA	Tahoe Water Suppliers Association
TYC	Tahoe Yellow Cress
UNR	University of Nevada Reno
US	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOI	United States Department of Interior
USFS	United Stated Department of Agriculture – Forest Service
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service
UVC	Ultraviolet Light Wavelength C
VMT	Vehicle Miles Traveled
VRPs	Visibility Reducing Particles
WQC	Water Quality Certification
WQO	Water Quality Order
WUI	Wildland Urban Interface

SUMMARY

DRAFT IS/IEC/EA

PROJECT Lake-Wide Control of Aquatic Invasive Plants Project

LEAD AGENCY Tahoe Resource Conservation District (CEQA), Tahoe Regional Planning Agency (TRPA), and U.S. Forest Service, Lake Tahoe Basin Management Unit (NEPA)

PROJECT DESCRIPTION

This combined CEQA Initial Study / Mitigated Negative Declaration (IS/MND), TRPA Initial Environmental Checklist/ Mitigated Finding of No Significant Effect (IEC/MFONSE) and NEPA Environmental Assessment/Finding of No Significant Impact (EA/FONSI) evaluates the environmental effects of the proposed Lake-Wide Control of Aquatic Invasive Plants Project (Project). Tahoe Resource Conservation District (Tahoe RCD), on behalf of the Tahoe Aquatic Invasive Species Coordination Committee (AISCC), and in coordination with the TRPA, is proposing to conduct aquatic plant control and management throughout suitable habitat areas in Lake Tahoe, tributaries, and marshes in California and Nevada, the Upper Truckee River, and the Truckee River between the dam at Lake Tahoe to River Ranch at Alpine Meadows Road. The project area does not include the channels and lagoons of the Tahoe Keys, as a separate analysis of treatment methods is occurring due to the significant differences in scale and complexity. The Project intends to continue aquatic invasive plant control efforts in locations where previous efforts have been successful, expand control efforts to include known infestation areas, expand available methods/techniques, and to allow for rapid response to detections of new aquatic invasive plant (AIP) infestations.

The annual objectives of the Project are to support the Lake Tahoe Region Aquatic Invasive Species Action Agenda by:

1. Limiting the spread of existing AIP in the Region by employing strategies that minimize threats to native species, and extirpate existing AIP populations when possible; and

2. Contributing to the abatement of harmful ecological, economic, social, and public impacts resulting from AIP.

Control actions will utilize the most effective methods at high-priority control sites and will include maintenance activities at sites that have been treated previously. New control sites within the project area could be identified if infestations are detected, and these control sites and the implementation of control methods could occur anywhere within the entire project area. The control strategy is to implement “early detection rapid response” so that no new AIP populations become established and reduce the acreage of AIP populations by 90 percent by 2030.

FINDINGS

A combined IS/MND, IEC/MFONSE, and EA/FONSI has been prepared to assess the Project’s potential effects on the environment and the significance of those effects. Based on the IS/MND, IEC/MFONSE, and EA/FONSI, it has been determined that the proposed Project would not have any significant effects on the environment after implementation of mitigation measures. This conclusion is supported by the following findings:

1. The proposed Project would have no effects related to agricultural and forest resources, land use and planning, mineral resources, and population and housing.

2. The proposed Project would have a less-than-significant impact on aesthetics, geology and soils, greenhouse gas emissions, energy, noise, wildfire, and public services.

3. Mitigation is required to reduce potentially significant impacts related to air quality, biological resources, cultural resources, water quality, hazards and public safety, recreation, transportation, and utilities.

Impacts found to be potentially significant and requiring mitigation include: air emissions if maintenance dredging is used to address AIP infestations; inadvertent discovery of buried cultural resources and work in areas near resources; accidental spill of oils or fuels associated with control actions that use mechanical equipment; worker safety at control sites on the airport property; water quality and increased turbidity as a result of control actions; public access limits and safety in areas where control actions are located in public recreation areas; water quality impacts on lake water intake facilities; navigational access and safety within active control sites; and control implementation impacts on biological resources, including sensitive plants within staging areas, nesting and migratory birds, and other protected species. These impacts are temporary and associated with active control implementation. Areas not actively treated would not be associated with those impacts.

For the purposes of this joint-agency document, mitigation measures identified herein, and which would be adopted as part of a Project approval, are serving as resource protection measures (RPMs) for NEPA purposes. The following mitigation measures would be implemented by Tahoe RCD to avoid or minimize environmental impacts. Implementation of these mitigation measures would reduce the environmental impacts of the proposed Project to a less-than-significant level. Table S-1 lists each mitigation measure and its applicability. Detailed text descriptions of each measure are found in the Section 3 impact analysis.

Table S-1

Proposed Mitigation Measures

Mitigation Measure	Applicable Control Actions	Applicable Control Locations
AQ-1 Idling Restrictions	Mechanical and Suction Dredging	All Locations
AQ-2: Dust Control Measures	Mechanical and Suction Dredging	All Locations
BIO-1: Sensitive Plant Protection	All Control Actions Except Hand Removal and Surveillance	Tributaries, Marshes and Near Shores of Lake Tahoe
BIO-2: Terrestrial Wildlife Species Surveys and Limited Operating Periods	All Control Actions Except Hand Removal and Surveillance	All Locations
BIO-3: Sierra Nevada Yellow-Legged Frog Surveys and Protection	All Control Actions Except Hand Removal and Surveillance	Previously Unsurveyed AIP Control Sites
BIO-4: Lahontan Cutthroat Trout, Lahontan Lake Tui Chub, and Native Fish Protection	All Control Actions Except Hand Removal and Surveillance	Within TRPA designated Prime Fish Habitat (TRPA 2015), Occupied Habitat, or a Migration Corridor for These Species
BIO-5: Great Basin Rams-Horn Snail Protection	Diver-Assisted Suction, All Control Actions, Except Hand Removal and Surveillance	Within Forest Service System Lands
CULT-1: Unanticipated Discovery	All Control Actions	All Locations

Table S-1

Proposed Mitigation Measures

Mitigation Measure	Applicable Control Actions	Applicable Control Locations
CULT-2: Class 1 Avoidance	All Control Actions	Within Historic Properties
CULT-3: Class 2 On-site Historic Property Management Measures	All Control Actions	Within Historic Properties
HAZMAT-1: Spill Prevention and Response	All Control Actions Except Hand Removal and Surveillance	All Locations
HAZMAT-2: Airport Safety and Coordination	All Control Actions	Within SLT Airport Property and the Runway Zone
HYDRO-1: Water Quality Compliance and Monitoring	All Control Actions Except Hand Removal and Surveillance	All Locations
REC-1: Public Notice and Staging Safety	Actions in which Public Access is Temporarily Restricted or that Use Staging Areas: Mechanical and Suction Dredging,	All Public Access Recreational Areas
TRANS-1: Communication Coordination and Securing Barriers and Aeration Systems	All Control Actions, Particularly Benthic Barriers and Aeration Systems	Marinas
TRIBAL-1: Tribal Cultural Resources Consultation	All Control Actions that Disturb the Substrate	Culturally Sensitive Areas
UTILITY-1: Service Provider Notification	All Control Actions Except Hand Removal and Surveillance	Within 0.25 mile of a water intake line

APPROVAL OF INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

Certification by Those Responsible for Preparation of this Document. Tahoe RCD has been responsible for the preparation of this mitigated negative declaration and the incorporated initial study. I believe this document meets the requirements of the California Environmental Quality Act, is an accurate description of the proposed project, and that the lead agency has the means and commitment to implement the project design measures that will assure the project does not have any significant, adverse effects on the environment. I recommend approval of this document.

________________________________ ____________________

Nicole Cartwright, Executive Director Date
Tahoe Resource Conservation District

Approval of the Project by the Lead Agency. Pursuant to Section 21082.1 of the California Environmental Quality Act, the Tahoe Resource Conservation District Board has independently reviewed and analyzed the initial study and mitigated negative declaration for the proposed project and finds that the initial study and mitigated negative declaration for the proposed project reflect the independent judgment of the Tahoe Resource Conservation District Board. The lead agency finds that the project mitigation measures (e.g., resource protection measures) will be implemented as stated in the mitigated negative declaration.

I hereby approve this project.

________________________________ ____________________

Carl Ribaudo, President Date
Tahoe Resource Conservation District

IEC CERTIFICATION [TRPA ONLY]

I hereby certify that the statements furnished below and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

____ ____________________

IEC Preparer Date

SECTION 1 INTRODUCTION

Tahoe Resource Conservation District (Tahoe RCD), ~~on behalf of the Lake Tahoe Aquatic Invasive Species Coordinating Committee (AISCC), and~~ in coordination with the Tahoe Regional Planning Agency (TRPA) and USDA Forest Service Lake Tahoe Basin Management Unit (LTBMU) are proposing to conduct invasive aquatic plant control and management throughout suitable habitat areas in Lake Tahoe, tributaries, and marshes in California and Nevada, the Upper Truckee River and the Truckee River between the dam at Lake Tahoe to River Ranch at Alpine Meadows Road. The project area does not include the channels and lagoons of the Tahoe Keys as a separate analysis of treatment methods is occurring due to the significant differences in scale and complexity. The Proposed Project (Project) described in this document is intended to continue aquatic invasive plant control efforts in locations where previous efforts have been successful, expand control efforts to include known infestation areas, expand available methods/techniques, and to allow for rapid response to detections of new aquatic plant infestations.

The Lake Tahoe Aquatic Invasive Species Coordinating Committee (AISCC) is comprised of twelve members representing federal, state and regional interests, and is charted to develop and oversee the comprehensive Lake Tahoe Region AIS program to attain the goals of Prevention, Early Detection and Rapid Response, and Control using integrated methods. The Committee facilitates and promotes communication and partnerships to ensure the efficient and effective deployment of resources in order to implement a sustained intergovernmental and private sector program that meets all State and Federal requirements. The AISCC works with a partnership of more than 50 public, private, and tribal stakeholders to realize those goals. In 2009, these partners worked collaboratively to develop the Lake Tahoe Region Aquatic Invasive Species Management Plan, which was then enacted by the Governors of California and Nevada and the Executive Director of Tahoe Regional Planning Agency (TRPA). The Plan was then approved by the federal Aquatic Nuisance Species Task Force. This overarching management plan identifies current and reasonably foreseeable threats to the Tahoe Region, discusses control and eradication strategies and methodologies, and describes a management and planning structure for implementation of prevention, control, and early detection/rapid response actions. This plan was revised in 2014, enacted by the Governors of California and Nevada, and the TRPA Executive Director, and approved by the federal Aquatic Nuisance Species Task Force. In 2015, University of Nevada, Reno researchers, Dr. Marion Wittmann and Dr. Sudeep Chandra, contracted with Tahoe RCD to co-author the Implementation Plan for the Control of Aquatic Invasive Species within Lake Tahoe. The Implementation Plan is tiered to the Lake Tahoe Region Aquatic Invasive Species Management Plan and identifies and prioritizes species and specific locations and strategies for aquatic invasive species (AIS) removal and control. The Implementation Plan supports exploration or development of new strategies and technologies for the control of AIS. Tahoe RCD leads AIP control efforts in the Basin by using current effective methods and testing innovative technologies.

Led by the AISCC, the Lake Tahoe Region AIS Action Agenda 2021-2030 (Action Agenda) was finalized in September 2019. The Action Agenda includes a comprehensive set of actions to address AIS and reduce the economic, environmental, and social effects of AIS in the Lake Tahoe Region. While the Action Agenda builds upon past efforts to control AIS, it recommends a significant increase in pace and scale to address existing and emerging AIS issues. The focus is to reduce the biomass of AIS in priority locations and suppress the spread of AIS through aggressive treatments on both new and established populations. There are two phases of the Action Agenda, with Phase I (2021-2025) focused on reducing AIP populations to maintenance levels, if not complete eradication levels outside the Tahoe Keys, and Phase II (2025-2030) focused on such efforts within the Tahoe Keys, with continued maintenance of areas outside of the Tahoe Keys. Control sites are prioritized in the Action Agenda, and the Action Agenda provides the framework under which individual project level decisions are made. This environmental document is used to support the Action Agenda and the decisions made by the AISCC and Action Agenda regarding priorities, control sites, and control actions.

While most of the lake is free of aquatic invasive plant (AIP) infestations, they have dramatically increased in Lake Tahoe in the past 15 years. Without maintaining control efforts, it is likely that infestations will continue to spread in Lake Tahoe and throughout the Truckee River and tributaries to Lake Tahoe, with potentially devastating results. Early detection, prevention, and constant maintenance are the best defense and offer the best hope for control, eradication, and successful management of any invasive plant infestation. Once widespread establishment has occurred, aquatic invasive plants are difficult and costly to control. The Action Agenda guides the prioritization of site selection based on risk of spread, infestation size and location, public benefit, cost and feasibility, and impacts to the environment.

The current Project is intended to continue AIP control efforts in locations where previous efforts have been successful, expand control efforts to include all known infestations areas, expand available methods/techniques, and to allow for rapid response to detections of new AIP infestations.

1.1 BACKGROUND

1.1.1 Aquatic Invasive Species

There are many threats to the world-famous clarity and water quality of Lake Tahoe, and only recently has attention turned to addressing the threat of invasive aquatic plants, particularly Eurasian watermilfoil (*Myriophyllum spicatum*) and more recently, curly-leaf pondweed (*Potamogeton crispus*)(Figure 1-1). Habitat disruption, loss of native plant and animal communities, loss of property values, reduced fishing and water recreation opportunities, and large public/private expenditures have accompanied aquatic invasive plant introduction in the lower 48 states (USACE 2009). As stated in the Lake Tahoe Region Aquatic Invasive Species Action Agenda 2021-2030, Eurasian watermilfoil and curly-leaf pondweed: reduce native species; adversely affect water quality and recreation by contributing to excessive phosphorous releases into the water during annual die-offs and impairing recreational boating navigation; are an aesthetic nuisance to local homeowners; and impede water flow. The occurrence of aquatic invasive plants has spread rapidly across the country with the help of boaters who unintentionally transport and spread plant fragments that adhere to boats and trailers.

Figure 1-1. Aquatic Invasive Plant Species

Eurasian watermilfoil (*Myriophyllum spicatum*)
(Photo credit: Joseph DiTomasso, PhD)

Curly-leaf pondweed (*Potamogeton crispus*)
(Photo credit: Leslie J Mehrhoff, University of Connecticut Bugwood.org)

Eurasian watermilfoil (EWM) and other aquatic invasive plants grow prolifically and aggressively, invading and altering native aquatic communities. Native aquatic plant communities provide many ecological benefits such as food and habitat for waterfowl, fish, and other aquatic organisms. They also help maintain water quality by absorbing nutrients, providing oxygen, and reducing shoreline erosion. However, when EWM is introduced it is able to dominate freshwater ecosystems quickly and can enhance its own habitat by trapping sediment in the water column and initiating a favorable environment for further establishment of other invasive species, such as warm-water fish. EWM is capable of spreading over long distances when fragmented by boat propellers and by way of buds, surface runners, and seed (USACE 2009). This species has long stems and feathery foliage, and tolerates both shallow and deep waters. EWM plants are capable of growing from tiny fragments as small as one inch long.

Equally aggressive, curly-leaf pondweed (CLP) spreads primarily by rhizomes and turions, which are small, hardened stem tips capable of rooting and germinating in the fall and winter. CLP has oblong blue-green leaves with wavy edges. This species reproduces through turions or buds that break off and create new plants. Like EWM, CLP spreads through introduction by boats and proliferates in marinas and other warm, shallow waters. Both of these aggressive invaders also tolerate a wide range of environmental conditions including low light levels, high or low nutrient water, and freezing water temperatures.

EWM has been present in Lake Tahoe for decades. During the 1997 flood event, EWM escaped from Lake Tahoe into the Truckee River and has now been documented downstream as far as Verdi, Nevada. Visual observations of EWM indicate sizable infestation patches have established between the dam at Lake Tahoe downstream to River Ranch restaurant at Alpine Meadows Road.

These two species are able to dominate the aquatic plant community in the lake and its tributaries, effectively reducing native species, adversely altering water quality and water flow, and resulting in aesthetic and recreational nuisances. Shallow areas with higher light penetration levels, higher water temperature, and flat substrates are ideal for these AIP to thrive. As discussed in the Lake Tahoe Region Aquatic Invasive Species Management Plan, a survival depth of up to 11 meters has been found to be the maximum depth of survival under natural conditions. As AIP populations have grown and spread, they have been identified in the tributaries of Lake Tahoe and associated marshes.

Current infestations and plant densities can be attributed to drought and low lake level conditions where the growing season has been extended, allowing plants to grow and spread for longer annual durations. Infestations to be addressed by this Project exhibit above average densities because not all infestations have been controlled and longer growing seasons in certain conditions have allowed individual plants to grow taller, making it more difficult for control activities to be successful.

1.1.2 Historical Aquatic Invasive Plant Control Efforts

Historical AIP control efforts and their results are summarized in Appendix A. These efforts include direct control action on AIP species through focused AIP removal activities, indirect AIP removal actions, such as during navigational maintenance dredging, and ongoing monitoring. Appendix A includes a list of actions that have occurred by location, maps of areas currently or previously treated, and other information on historical efforts to control AIP.

1.2 PURPOSE AND NEED

As described above, the invasion, establishment, and spread of aquatic invasive plants are threatening the environmental quality of portions of Lake Tahoe and the Truckee River. The Lake Tahoe Aquatic Invasive Species Management Plan identifies aquatic invasive plant control projects in Lake Tahoe as a program objective. The focus of aquatic invasive plants (AIP) control projects in Lake Tahoe and Truckee River is to control existing infestations of invasive plant species to avoid and mitigate potential nuisances on the human population while improving native fish and plant habitats, and maintain treated areas to prevent re-infestation or further spread.

The purpose of this environmental document is to support the Action Agenda by providing analysis of environmental effects for the physical removal or control of AIPs in Lake Tahoe and Truckee River, to support ongoing AIP control efforts in locations where previous efforts have been successful, expand control efforts to include all known infestation areas, expand available methods and techniques, and to allow for rapid response to detections of new AIP infestations. This document is prepared in accordance with the guidelines established by the California Environmental Quality Act (CEQA) and the TRPA Rules of Procedure (Article VI) and Section 3.3 of the Code of Ordinances. Further, this document is prepared in accordance with the guidelines established by CEQA in accordance with the regulations established by the National Environmental Policy Act (NEPA). This document and the control methods analyzed are not intended to be used to increase boater access or the application of mechanical dredging to expand boater access.

Once the documentation is completed and approved by the lead agencies, conditional permits from other regulating agencies may be granted to Tahoe RCD **and/or other project proponents** for implementation of the Proposed Project. The Action Agenda decision-making team will determine which method or methods are best suited to each control site, taking into account the characteristics of the control site, breadth of infestation, access, cost, and other factors. Once infestation site-specific project plans are developed, the plans are then submitted to the appropriate reviewing agencies based on site jurisdiction and the proposed activity, as needed. For example, subsequent site specific TRPA project applications would use this environmental document as supporting information for a site specific IEC. Permit conditions may require modification of proposed project plans for specific treatment areas for compliance.

The purpose of the Project is to control or eradicate aquatic invasive plant populations in Lake Tahoe and Truckee River. This Project will complement previous efforts throughout Lake Tahoe area that have tested the efficacy of different aquatic plant removal methods. Attempts to control or locally eradicate AIP, specifically EWM and CLP have been on-going in Lake Tahoe since 2007. EWM and CLP were confirmed to be in Lake Tahoe by the U.S. Department of Agriculture–Agricultural Research Service in 1995 and 2003, respectively (Anderson 2007). EWM are spread primarily through boats and boat trailers that have not been cleaned prior to entering the lake, spreading species from one waterway to the next, and from aquarium dumping.

The overall goal of the Project is to remove AIP species from Lake Tahoe, its tributaries and marshes, the Upper Truckee River, and Truckee River to improve water quality, enhance physical and biological habitat conditions for native fisheries and wildlife, and to inhibit the establishment and spread of other aquatic invasive species. If infestations can be controlled promptly, the extent of control activities will ultimately shrink over time; however, it is important to be able to treat areas before AIP grow extensively and spread, which not only result in higher treatment costs, but increases the time invested and difficulty of treating the infestation. Untreated, AIP infestations spread and grow larger in size, increasing the area and intensity of treatment and decreasing the likelihood of eradicating AIP. Therefore, this large project area is proposed so that multiple areas can be treated simultaneously, and AIP populations can be controlled as they are identified. Limits on treatment contribute to a cumulatively considerable increase in AIP infestations. Early detection and the ability to implement a variety of control methods is needed to reduce spread and increase control success.

Proven methods for addressing these AIP species include using gas permeable benthic barriers and diver-assisted suction removal used in combination throughout the growing season. While this combination of methods has been successful, limitations do exist. Low lake level, wave action, lake-bottom morphology, high boater use areas, marina environments, marsh environments and turbidity can impede the effectiveness of these methods. Therefore, additional tools to treat AIP infestations are needed. Advancing the development of new technology and analyzing the potential environmental effects of using new methods will greatly increase the ability to strategically implement control measures. The environmental review of the Project will build the path to scale up and increase the pace of treating large or persistent infestations by having the appropriate tools to use in the right locations.

Successful control efforts are needed to increase public safety, improve water quality, and protect Lake Tahoe's biodiversity and recreation based economy. Dense growth of invasive aquatic plants can impede water flow, disrupt navigation, discourage recreation, negatively affect water quality, and reduce plant diversity. Non-native plants can "pump" nutrients from the sediment to the overlying water column during growth and may be contributing to increased phytoplankton and reductions in water clarity. Control of invasive aquatic plants is needed to help support other control efforts like warm-water target invasive fish removal and suppression.

1.3 LEAD AGENCIES

The CEQA environmental document requires a lead agency (CEQA Guidelines Section 15367). Tahoe RCD is the project lead for CEQA. TRPA is the project lead for the TRPA Initial Environmental Checklist. The U.S. Department of Agriculture Forest Service, Lake Tahoe Basin Management Unit (LTBMU) is the project lead for NEPA. The lead agency is the public agency that has the primary responsibility for carrying out or approving a project, and must have discretionary authority. It is the lead agency's responsibility to determine what level of environmental review document is appropriate for the proposed project or action. Since this project falls under CEQA, NEPA, and the TRPA Planning Compact, there are three lead agencies and three separate decisions on the project. Each of the three lead agencies are discussed below:

The U.S. Forest Service LTBMU has jurisdiction of federally designated land within the Lake Tahoe Basin including lands within the project area. This Environmental Assessment (EA) is being prepared to support approval of the project.

Tahoe RCD is a local agency formed by the California Legislature in 1974. Representatives from Tahoe RCD are chair of the NAWWG and co-chair of AISCC. Tahoe RCD leads the implementation of the prevention program and control program for AIP removal.

Under the Tahoe Regional Planning Compact, TRPA was granted authority to adopt environmental quality standards, called thresholds, and to enforce ordinances designed to achieve the thresholds. TRPA is charged with overseeing the implementation of the Lake Tahoe Region AIS Management Plan and is the administering agency for the Environmental Improvement Program (EIP). The Project is an EIP project for Aquatic Invasive Plant Species Control. As EIP administrator and permitting agency, TRPA provides an advisory representative to the NAWWG and is co-chair of AISCC. Approval of the Project would require preparation of a TRPA Initial Environmental Checklist (IEC). The Project must also comply with the TRPA Regional Plan and the Code of Ordinances.

1.4 LEGAL AUTHORITY

1.4.1 CEQA

Tahoe RCD is the lead agency under provisions of CEQA and numerous other state agencies (e.g., California Department of Fish and Wildlife) will participate as responsible agencies. CEQA requires that state and local government agencies consider the environmental consequences of projects over which they have discretionary authority before acting on those projects. This Initial Study (IS), prepared in accordance with the CEQA Statutes

(Public Resources Code Section, 21000 et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14 CCR § 15000), presents sufficient information to allow Tahoe RCD to determine whether the Project may have a significant effect on the environment, requiring preparation of an Environmental Impact Report (EIR). The CEQA Appendix G Checklist is provided in Section 3 of this IS.

If Tahoe RCD finds substantial evidence that any aspect of the Project, either individually or cumulatively, may have a significant effect on the environment, regardless of whether the overall effect of the Project is adverse or beneficial, Tahoe RCD must prepare an EIR. If Tahoe RCD finds no substantial evidence that the Project or any of its aspects may cause a significant effect on the environment, a Negative Declaration shall be prepared. If in the course of analysis, Tahoe RCD recognizes that the Project may have a significant impact on the environment, but that by incorporating specific mitigation measures the impact will be reduced to a less than significant effect, a Mitigated Negative Declaration (MND) shall be prepared.

The IS also provides sufficient information for responsible and trustee agencies to use as the basis for CEQA compliance, such as the California Tahoe Conservancy (CTC), California Department of Fish and Wildlife (CDFW) and Regional Water Quality Control Board – Lahontan Region (Lahontan). The IS is not, in and of itself, a decision document. The document's purpose is to evaluate the environmental consequences of implementing the Project and to identify measures, if necessary, to avoid significant impacts.

Although the lead agency (Tahoe RCD Board) must consider the information in the IS, the document's conclusions do not dictate the lead agency's discretion to approve or disapprove the Project. The decision-making document is the MND that records the agency's decision and is also circulated for public review. The content requirements for a MND (CEQA Guidelines, Section 15071) are:

- Description and title of the Project;
- Location of the Project, preferably shown on a map;
- Name of the Project Applicant;
- A proposed finding that the Project will not have a significant effect on the environment;
- An attached copy of the Initial Study documenting reasons to support the finding; and
- Mitigation measures, if any, included in the Project to avoid potentially significant effects.

The State Clearinghouse (SCH) circulates the environmental documentation for agency review and requests a completed Notice of Completion (NOC) form to be submitted with the 15 copies of the draft MND. This form facilitates the processing of environmental documents and is circulated to state agencies together with the MND. The information from the NOC form is entered into the SCH database. The normal public review period for a Negative Declaration submitted to the SCH is 30 calendar days (see CEQA Guidelines, Section 15105), and the public review period shall not be less than 20 days for a MND. Comments are forwarded to the SCH prior to the end of the assigned review period. At the end of the state review period, comments from the reviewing state agencies are collected at the SCH. A closing letter and a complete package of comments are forwarded to the Lead Agency on the day following the close of the review period. On April 23, 2020 Governor Newsom issued (Executive Order N-54-20) which does not affect the review period, but does affect noticing requirements. Rather than requiring the lead agency to file notices with the County Clerk/Recorder, the order directs lead agencies to post the notice on their website for the same period as would have been required of the Clerk/Recorder's office, submit a notice to the State Clearinghouse CEQAnet web portal, and engage in outreach to any individuals and entities known by the lead agency, responsible agency, or applicant to be parties interested in the project, and any other appropriate methods for the project.

Within five working days of approving a project for which an MND has been adopted, Tahoe RCD must file a Notice of Determination (NOD). The filing of the NOD typically begins a 30-calendar-day statute of limitations on court challenges to the project approval under CEQA; however, Governor Newsom issued a temporary 90-day extension on the statute of limitations due to the COVID-19 pandemic on April 23, 2020 (Executive Order N-54-20). Therefore, a 90-calendar-day statute of limitations may apply unless the executive order is repealed.

1.4.2 TRPA

The Project Area is located in the Lake Tahoe Region and is therefore under the jurisdiction of the TRPA. TRPA is the lead agency under the Tahoe Regional Planning Compact (PL 96-551 94 Statute 3233). As such, this document includes an IEC, prepared in accordance with Article VII of the Tahoe Regional Planning Compact, TRPA revised Code Section 3.3, specifically Subsection 3.3.2, and Article VI of the TRPA Rules of Procedure. The responsible body for the TRPA is the Governing Board. The Governing Board's decision shall consider: consistency of the Project with the TRPA Regional Plan and Environmental Threshold Carrying Capacities and project approval or denial.

TRPA utilizes an IEC, which is used to determine whether an environmental impact statement (EIS) shall be prepared for a project. The IEC provides information identifying the environmental effects of the Project and includes:

- An identification of the environmental effects;
- A discussion of proposed mitigation for significant adverse effects, if any;
- The name of the person who prepared the responses; and
- Supporting data or evidence to support the responses.

1.4.3 NEPA

The LTBMU is the lead agency under NEPA, as some control actions may occur within or require access on land managed by the U.S. Forest Service. The Forest Supervisor is the Responsible Official for this project to comply with NEPA. Given the purpose and need, the Responsible Official reviews the proposed action in order to decide whether or not the project will be implemented as described and whether or not a Finding of No Significant Impact (FONSI) can be supported by the environmental analysis contained in this EA.

The National Environmental Policy Act (1969) is a Federal law applicable to all Federal agencies, **and this document may be used by other project proponents to undertake AIP control projects (e.g., federal funding or permitting)**. NEPA requires Federal agencies to undertake an environmental assessment of their proposed actions before making decisions and taking action. Most federal agencies, including the USACE and USDA Forest Service, also have enacted their own, agency-specific NEPA implementing regulations. The NEPA process is intended to promote better agency decisions by ensuring high-quality environmental information is available to agency officials and the public before the agency decides whether and how to undertake a federal action. The appropriate NEPA documentation for a particular proposed project or action depends largely on the significance, in terms of context and intensity, of the project's potential environmental impacts. An EA is prepared for federal actions when the significance of environmental impact is not clear. If after preparing an EA, it is determined that the impact is significant, an EIS is then prepared. If not, a finding of no significant impact (FONSI) is documented.

Applicable laws addressed in NEPA, include, but are not limited to, the National Forest Management Act, the National Historic Preservation Act, the Clean Air Act, the Clean Water Act, the Wilderness Act, and the Endangered Species Act.

Executive Order 12898 requires that all federal actions consider potentially disproportionate effects on minority and low-income communities, especially if adverse effects on environmental or human health conditions are identified. Adverse environmental or human health conditions created by the project and any alternatives would not affect any minority or low-income neighborhood disproportionately. The activities proposed were based solely on the existing and desired condition of the project area. In no case were the project designs based on the demographic makeup, occupancy, property value, income level, or any other criteria reflecting the status of adjacent non-federal land. Reviewing the location, scope, and nature of the project in relationship to non-federal land, there is no evidence to suggest that any minority or low-income neighborhood would be affected disproportionately. Conversely, there is no evidence that any individual, group, or portion of the community would benefit unequally from any of the actions in the project.

The National Forest Management Act (NFMA) requires the development of long-range land and resource management plans and the 2016 LTBMU Land and Resource Management Plan (Forest Plan) is the guidance document for natural resource management activities on LTBMU. The 2016 Forest Plan includes invasive species management strategies, standards and guidelines, which indirectly direct water quality management for NFS lands. Refer to Section 3.5 for discussions of AIP management and how the proposed action would implement an integrated management approach that evaluates available AIP control methods, as well as addresses potential adverse effects to native species and ecosystem processes on NFS lands.

1.5 OTHER RESPONSIBLE OR PERMITTING AGENCIES

Under CEQA, a responsible agency is a public agency, which proposes to carry out or approve a project for which the lead agency is preparing a MND. Responsible agencies have a discretionary approval power over the project. Numerous federal, state, and regional regulations and programs are in place in the Lake Tahoe Region to limit the introduction and spread of AIP with no single agency or group responsible for AIP issues. This Project will require the review and approval of federal, state, and local agencies in addition to the Lead Agencies identified in Sections 1.3 and 1.4. Some of the agencies identified here are permitting agencies and may approve this Project through a defined permit, consultation, or agreement process. Figure 1-2 illustrates land ownership within the Project Area.

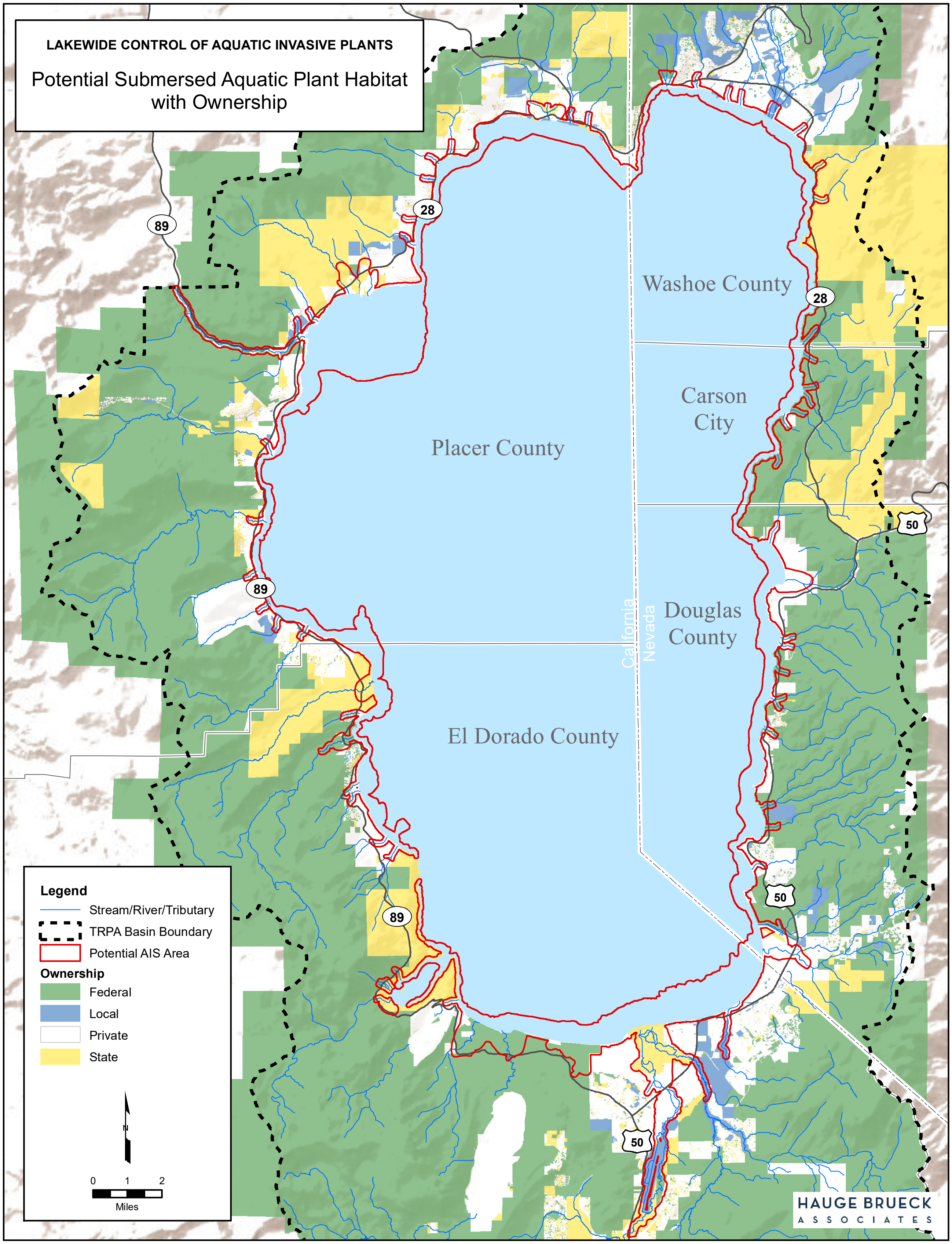
1.5.1 U.S. Army Corps of Engineers

As the nation’s environmental engineers, the USACE is tasked with restoring degraded ecosystems, constructing sustainable facilities, regulating waterways, managing natural resources and cleaning up contaminated sites from past military activities. The USACE is one of the leading federal ecosystem restoration agencies in the Lake Tahoe Basin and has worked with local, state and other federal partners since 1997 to preserve the lake’s prized clarity by restoring natural inflows and controlling invasive species. USACE involvement in the Lake Tahoe Basin is shaped by two programs: the Tahoe Partnership and the Tahoe Section 108 programs. The Tahoe Partnership program provides watershed planning and restoration as part of a multi-agency environmental improvement program to increase global climate change adaptation policy and improve storm water models and tools.

The U.S. Army Corps of Engineers (USACE) has jurisdiction of Wetlands and Other Waters of the United States, including Lake Tahoe. The Project falls under USACE jurisdiction as a permitting agency requiring implementation of a Section 404 permit to comply with the Clean Water Act (CWA) of 1972 and potentially 408 Permission to comply with the Section 10 of the Rivers and Harbors Act of 1899. Authorization for the Project is covered under Nationwide Permit (NWP) 27 - Aquatic Habitat Restoration, Enhancement, and Establishment Activities. On August 26, 2019, USACE determined that Project activities were authorized by NWP 27, and required implementation of the following conditions:

1. Compliance with all terms and conditions of the July 26, 2019, Section 401 Water Quality Certification for all work within Nevada.
2. Water quality certification under Section 401 of the Clean Water Act must first be issued or waived for the activities requiring a permit from USACE.
3. Mitigating measures identified in the U.S. Fish and Wildlife Service letter of concurrence (Number 2019-I-0612, dated August 15, 2019) must be implemented. If any of these measures are unable to be implemented, USACE and the U.S. Fish and Wildlife Office must be immediately notified, and consultation completed, prior to initiating the work, in accordance with Federal law.

Figure 1-2. Land Ownership within the Project Area



Sources: ArcGIS Online shaded relief map service; TRPA; Tahoe Resource Conservation District. Map date: November 14, 2019.

4. Dredging is prohibited in all areas identified as sensitive for submerged cultural resources in the *Lake-Wide Aquatic Invasive Plant Control Project, Lake Tahoe California and Nevada Cultural Resources Report*, prepared by California Department of Parks and Recreation.

USACE also requires that the Compliance Certification is signed and returned within 30 days of completing the authorized work. The August 26, 2019 authorization states that it is valid until March 18, 2022 when the nationwide permits are scheduled to be modified, reissued, or revoked. According to recent USACE communication (Thomason, 12/17/19), the NWP 27 will be replaced early in 2020, but the existing permit is valid through March 18, 2022.

Under CWA Section 404(e), the USACE can issue general permits to authorize activities that have only minimal individual and cumulative adverse environmental effects. General permits can be issued for a period of no more than five years. A nationwide permit (NWP) is a general permit that authorizes activities across the country, unless a district or division commander revokes the nationwide permit in a state or other geographic region. The USACE will review the Project for authorization under NWP 27. USACE division engineers may add, after public review and consultation, regional conditions to nationwide permits in order to protect local aquatic ecosystems or to minimize adverse effects on fish or shellfish spawning, wildlife nesting or other ecologically critical areas. Division and district commanders are also charged with ensuring appropriate coordination and consultation occurs with federally-recognized American Indian governments.

Regional conditions for NWP 27 include pre-construction notification (PCN) with a written description and drawings, best management practices, a description of dewatering activities if applicable, and a justifications that the action would result in a net increase in aquatic resource functions and services, such as maintenance of plant and animal communities (Final SPK Regional Conditions for Nevada and the Lake Tahoe Basin Effective March 19, 2017 to March 18, 2022).

Laminar flow aeration (LFA) is subject to USACE Section 404 and Nationwide Permit 5, while benthic barriers and dredging (suction and mechanical) are subject to Section 404 and Nationwide Permit 27. Diver-assisted suction removal and UVC light control methods are subject only to Section 10. Surveillance and hand removal activities are not subject to Sections 404 or 10 or nationwide permits.

USACE is also responsible for Section 106 compliance with the NHPA and Section 7 consultation with the United States Fish and Wildlife Service (USFWS) as a federal permitting agency.

1.5.2 U.S. Fish and Wildlife Service

The USFWS plays an advisory role in the CWA 404(B) permitting process administered by the USACE and overseen by the USEPA. The USFWS mission is working with others to protect, conserve, and enhance fish, wildlife and plants, and their habitats, for the continuing benefit of the American people. The USFWS mission is authorized and accomplished via various authorities, including the Fish and Wildlife Coordination Act, Fish and Wildlife Act of 1956, Food Security Act, Anadromous Fish Conservation Act, Migratory Bird Treaty Act (MBTA), and Endangered Species Act (ESA). If a threatened or endangered species is observed within the Project Area, Section 7 consultation must occur. Lahontan cutthroat trout and Tahoe yellow cress are federal listed species that occur in the Project Area.

Federal authority to limit the interstate transport and importation to the U.S. of prohibited plant species is provided by the USDA-Animal and Plant Health Inspection Service-Plant Protection and Quarantine (USDA-APHIS-PPQ) (Plant Protection Act of 2000) and prohibited wildlife species authority is provided USFWS through the Lacey Act. USFWS may provide funding toward Project implementation.

On July 1, 2019, USACE requested informal consultation under Section 7 with the USFWS for the Tahoe RCD's Lakewide Aquatic Invasive Plant Control Project permit application. Based on USFWS correspondence dated August 15, 2019, USCAE determined that diver assisted suction, UVC light, and benthic barriers are not likely to adversely affect the Federally-listed Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*) or critical habitat. Consultation for SNYLF has not yet occurred as the 2019 USACE permit is for AIP control in Lake Tahoe only and does not include newly proposed tributary or marsh habitats.

In accordance with Section 7(c) of the Endangered Species Act and the NFMA, the U.S. Fish and Wildlife Service (USFWS) list of endangered and threatened species that may be affected by projects in the Lake Tahoe Basin Management Area was reviewed (August 9, 2018) and effects on those species are analyzed in the Aquatic and Terrestrial Wildlife BA/BE's.

A Migratory Bird Report has been prepared for this project which fulfills the requirements of the Migratory Bird Treaty Act of 1918 as amended (16 USC 703-712) and Executive Order 13186. In accordance with Executive Orders 13751 of December 8, 2016 and 13112 of February 3, 1999 an Invasive Plant Risk Assessment has been prepared. The project's mitigation measures (e.g., RPMs) are designed to minimize risk of new invasive plant introductions.

1.5.3 Advisory Council on Historic Preservation

Section 106 of the NHPA requires federal agencies to take into account effects of projects on historic properties caused by federal actions, and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings though consultation with the California State Historic Preservation Officer (SHPO) and Nevada SHPO. The US Forest Service has responsibility for carrying out the requirements of Section 106 of the NHPA on National Forest Lands; however, other agencies also have responsibilities for ensuring the requirements of Section 106 are carried out within their jurisdictions, such as US Army Corps of Engineers. Because the Project also includes sites in California and Nevada, the California and Nevada SHPO will utilize the cultural resources analysis on this Project.

1.5.4 California Tahoe Conservancy

The California Tahoe Conservancy (Conservancy) is a responsible agency for this project. Their mission is to lead California's efforts to restore and enhance the natural and recreational resources in the Lake Tahoe Region. This mission is achieved in part through management of approximately 6,500 acres owned by the Conservancy for the purpose of protecting the natural environment and promoting public recreation, and is also achieved through funding environmental improvement projects. The Conservancy provides grants to local agencies and organizations to restore the watershed, provide public recreation and access, protect ecologically important lands, improve forest health, and reduce wildfire threat.

In 2018, the Conservancy initiated an effort to support the development of short-and long-term management targets and specific actions to control aquatic invasive species in the Lake Tahoe Region. This led to the development of a 10-year Action Agenda and associated investment strategy in coordination with the Lake Tahoe Aquatic Invasive Species Coordinating Committee (LTAISCC). In relation to this project document, the Conservancy will need to consider the IS/MND, approve the potential project, and adopt the Mitigation Monitoring and Reporting Plan (MMRP) when authorizing AIP control project grant awards. The Conservancy is also a member of the LTAISCC and a commenter under public review.

1.5.5 California Department of Fish and Wildlife

In California, the CDFW is responsible for prohibited fish and wildlife resources (CCR, Title 14) and is the lead agency for the California AIS Management Plan (CAISMP). CDFW Code §2301 allows CDFW designated staff (and other authorized state authorities, i.e., CDPR peace officers and California Department of Food and Agriculture [CDFA]) to inspect, impound or quarantine any conveyance (e.g., watercraft) that may carry dreissenid mussels (i.e., quagga and zebra mussels). CDFW is the lead agency for regulatory activities associated with noxious weeds (CAC Title 3, Sec. 3400). A Lake and Streambed Alteration Agreement (LSAA) for Routine Maintenance, 1600-2014-0082-R2, as amended, is applicable to benthic barriers, hand removal, and hand suction removal controls (issued for these actions in 2014). LSAA 1600-2014-0082-R2 requires documentation, a Verification Request Form, notification, and annual reporting for each control site. Since this Project would expand the treatment area, an amendment is needed to include those areas if the LSAA is extended beyond its five-year term. Since the LSAA expires prior to implementation, a new LSAA for Routine Maintenance is appropriate and would need to include the expanded treatment area. Dredging control actions would require additional LSAAs, specific to the area to be affected and dredging method used. The LSAA does not authorize take of listed species.

1.5.6 California Department of Parks and Recreation

The CDPR issues an Encroachment Permit. The mission of the CDPR is: to provide for the health, inspiration and education of the people of California by helping to preserve the state´s extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation. The CDPR is a Tahoe Integrated Information Management System (TIIMS) stakeholder that participated in the requirements analysis for the AIS Management Plan. CDPR is responsible for overseeing State Park lands that lie within the California side of the Lake Tahoe Basin. As such, they maintain the lands and provide educational information to park visitors. Specifically, they oversee the following park units: Burton Creek State Park, D. L. Bliss State Park, Ed Z'berg Sugar Pine Point State Park, Emerald Bay State Park, Kings Beach State Recreation Area, Lake Valley State Recreation Area, Tahoe State Recreation Area, Ward Creek Unit, and Washoe Meadows State Park.

1.5.7 Regional Water Quality Control Board – Lahontan

The Federal Clean Water Act (CWA) gives states the primary responsibility for protecting and restoring surface water quality. The Total Maximum Daily Load (TMDL) Program addresses impaired waters of the Region and satisfies CWA Section 303 and 305 requirements. Lahontan TMDL staff evaluate waterbody data to determine if water quality objectives are met or are being exceeded. The assessment is presented in the Integrated Report and identifies impaired waterbodies on the CWA 303(d) list. The Integrated Report also provides information about waterbodies, which attain their beneficial uses for the 305(b) report.

Lake Tahoe is designated an Outstanding National Resource Water and a “Waterbody of extraordinary ecological or aesthetic value” by the states of California and Nevada, respectively, for its world famous clarity and striking blue color. However, over the past half century clarity has diminished, threatening Lake Tahoe’s value as one of the few large alpine lakes in the world with exceptionally clean and clear waters. USEPA approved the Lake Tahoe TMDL in August 2011. Lahontan and Nevada Division of Environmental Protection (NDEP) collaborated to develop the Lake Tahoe Total Maximum Daily Load (TMDL), a science-based plan initiated to better understand the causes of clarity loss, determine how much pollution needs to be reduced to reinstate historic clarity levels, and develop a workable, cost-effective implementation strategy. The Lake Tahoe TMDL Program is now in the implementation and tracking phase, with controls being implemented to reduce pollutant loading to Lake Tahoe.

California State law assigns responsibility for protection of water quality within the Lahontan watershed basin, which fully contains the California side of the Lake Tahoe Basin, to the California Regional Water Quality Control Board – Lahontan Region (Lahontan). Lahontan implements and enforces the Porter-Cologne Water Quality Control Act (California Water Code Section 1300 et seq.) and the Water Quality Control Plan for the Lahontan Region (Basin Plan). Lahontan will be a responsible agency under CEQA and will need adequate CEQA documentation as the basis for issuing CWA Section 401 water quality certification and/or waste discharge requirements. As such, Lahontan must ensure compliance with CEQA when taking discretionary actions on this Project.

Section 402 of the CWA is directly relevant to earthwork and grading in the Project Area's staging areas and establishes the National Pollutant Discharge Elimination System (NPDES) program that Lahontan implements in Lake Tahoe. Projects with construction activities disturbing greater than one acre must apply for coverage under Board Order No R6T-2016-0010, prepare a Notice of Intent (NOI) and implement a Stormwater Pollution Prevention Plan (SWPPP). BMPs must be installed and maintained to avoid adverse impacts to receiving water quality as defined by Chapter 5 of the Basin Plan. Upon completion of the Project, a Notice of Termination (NOT) must be submitted to Lahontan to indicate that construction is completed.

Lahontan issues Board Orders and can issue exemptions to the Basin Plan, which have occurred in the past for Tahoe RCD Lakewide AIP Control Projects in Placer and El Dorado Counties, California. Previous Board Orders have addressed diver assisted suction removal, hand removal, and use of benthic barriers in Lake Tahoe and the Truckee River.

As stated in the Basin Plan, *"*The Basin Plan allows exemptions to certain waste discharge prohibitions if the applicable criteria are met…Exemptions are generally provided on a case-by-case basis, although the Regional Board may find that certain types of discharges are exempt from certain or all applicable waste discharge prohibitions." The Basin Plan Regionwide Prohibitions and exemptions are as follows:

> "1. The discharge of waste that causes violation of any narrative or numeric water quality objective contained in this Plan is prohibited.
>
> 2. Where any numeric or narrative water quality objective contained in this Plan is already being violated, the discharge of waste that causes further degradation or pollution is prohibited.
>
> 3. The discharge of waste that could affect the quality of waters of the state that is not authorized by the State or Regional Board through waste discharge requirements, waiver of waste discharge requirements, NPDES permit, cease and desist order, certification of water quality compliance pursuant to Clean Water Act section 401, or other appropriate regulatory mechanism is prohibited.
>
> 4. The discharge of untreated sewage, garbage, or other solid wastes into surface waters of the Region is prohibited. (For the purposes of this prohibition, "untreated sewage" is that which exceeds secondary treatment standards of the Federal Water Pollution Control Act, which are incorporated in this plan in Section 4.4 under "Surface Water Disposal of Sewage Effluent.").
>
> 5. The discharge of pesticides to surface or ground waters is prohibited.
>
> An exemption to prohibitions 1 and 2, above, may be granted whenever the Regional Board finds all of the following:
>
> 1. The discharge of waste will not, individually or collectively, directly or indirectly, adversely affect beneficial uses, and
> 2. There is no reasonable alternative to the waste discharge, and
> 3. All applicable and practicable control and mitigation measures have been incorporated to minimize potential adverse impacts to water quality and beneficial uses. "

There are also exemptions for restoration projects:

> "The Regional Board encourages restoration projects that are intended to reduce or mitigate existing sources of soil erosion, water pollution, or impairment of beneficial uses. For waste earthen materials discharged as a result of restoration projects, exemptions to the above prohibitions, and all other prohibitions contained in this Basin Plan, may be granted by the Regional Board's Executive Officer whenever a specific project meets all of the following criteria:
>
> 1. The project will eliminate, reduce or mitigate existing sources of soil erosion, water pollution, and/or impairment of beneficial uses of water, and
> 2. There is no feasible alternative to the project that would comply with the Basin Plan prohibitions, and
> 3. All applicable and practicable control and mitigation measures have been incorporated into the project to minimize land disturbance, soil erosion, discharges of turbid water, and other potential adverse impacts to water quality and beneficial uses to the minimum necessary to complete the project."

Chapter 5 of the Basin Plan specifically addressed the Lake Tahoe Basin. Discharge prohibitions for the Lake Tahoe Hydrologic Unit:

1. The discharge attributable to human activities of any waste or deleterious material to surface waters of the Lake Tahoe HU is prohibited.

   An exemption to this prohibition may be granted whenever the Regional Board finds all of the following:

   A. The discharge of waste will not, individually or collectively, directly or indirectly, adversely affect beneficial uses, and
   B. There is no reasonable alternative to the waste discharge, and
   C. All applicable and practicable control and mitigation measures have been incorporated to minimize potential adverse impacts to water quality and beneficial uses.

2. The discharge attributable to human activities of any waste or deleterious material to land below the highwater rim of Lake Tahoe or within the 100-year floodplain of any tributary to Lake Tahoe is prohibited.
3. The discharge attributable to human activities of any waste or deleterious material to Stream Environment Zones (SEZs) in the Lake Tahoe HU is prohibited.
4. The discharge or threatened discharge attributable to new pier construction of wastes to significant spawning habitats or to areas immediately offshore of stream inlets in Lake Tahoe is prohibited.

Exemptions to prohibitions 2 and 3 may be granted if findings can be made indicating 1) there is no reasonable alternative and 2) impacts are fully mitigated.

Lakewide AIP Control actions or sites not previously covered by a Lahontan Exemption must be submitted to Lahontan for review and approval. Certification conditions include reporting of the control actions used, cleaning of equipment and other best management practices, accidental discharge notification requirements, and others.

With respect to managing AIS, the Basin Plan states that region wide water quality objectives for pesticides, and related objectives for nondegradation and toxicity, essentially preclude direct discharges of pesticides such as aquatic herbicides. Although a Basin Plan amendment to allow consideration of temporary exemptions to the water quality objectives to prevent the spread of disease or invasive species is currently under review of the United States Environmental Protection Agency (USEPA), the Project does not include the use of aquatic pesticides to control AIP.

1.5.8 California State Lands Commission

The State of California acquired sovereign ownership of tide and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of people of the State for statewide Public Trust purposes, which include waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation and open space. The boundaries of these State-owned lands generally are based upon the last naturally occurring location of the ordinary high or low water marks prior to artificial influences, which may have altered or modified the river or shoreline characteristics. On navigable non-tidal waterways, the State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement exists landward to the ordinary high water mark, as they last naturally existed. The State's sovereign interests are under the jurisdiction of the California State Lands Commission (CSLC).

With respect to Lake Tahoe, the State's sovereign ownership extends water ward from the low water mark, which has been established as elevation 6,223 feet, Lake Tahoe Datum (LTD). Consequently, any activity involving the State's sovereign lands in Lake Tahoe below elevation 6,223 feet LTD requires a lease from the CSLC. Uses requiring approval of a lease from the CSLC must also comply with the CEQA. The area lying between the high and low tide lines of Lake Tahoe is subject to a Public Trust easement for commerce, navigation, fishing, recreation and preservation. Uses situated between the high and low water marks must be consistent with the uses permitted under the Public Trust.

Permission from the CSLC would be required to implement the proposed activities contemplated by resource managers and researchers. The form of that permission would vary in accordance with the specific activity and its location and, therefore, would be determined on a case-by-case basis. Prior AIP removal and maintenance projects have been covered under an existing lease with CDPR: General Lease – Public Use No. PRC 7366.9.

1.5.9 Nevada Division of State Lands

The Nevada Division of State Lands (NDSL) leads the State of Nevada's programs to protect Lake Tahoe, including coordination of the Nevada Tahoe Resource Team (NTRT). NTRT is an interagency team dedicated to preserving and enhancing the natural environment in the Lake Tahoe Basin. The Division also administers other special programs as well as provides staff assistance to the Nevada TRPA and the State Land Use Planning Advisory Council. Nevada Division of State Lands requires a Management License. The authorization term applies for a period of ten years once an application has been submitted and approved. Copies of TRPA, USACE, and Nevada Division of Environmental Protection (NDEP) should be submitted with the application and fees applied. The authorization will require lakebed disturbance be kept to a minimum and that equipment is cleaned. It will also require no discharge of substances that would cause a violation of water quality standards of Lake Tahoe or the State of Nevada.

1.5.10 Nevada Division of Environmental Protection – Bureau of Safe Drinking Water

The mission of the Bureau of Safe Drinking Water is to protect the public health of the citizens, tourists and visitors to the State by assuring that the public water systems provide safe and reliable drinking water. Nevada Revised Statute 445A.800 states, "It is the policy of this state to provide for water which is suited for drinking and other domestic purposes and thereby promote the public health and welfare." With respect to the Project, control activities in and around water intakes that involve physical removal processes (e.g., that could disturb sediment and increase turbidity) can have an impact on compliance with regulations and serving potable water. The Bureau is responsible for 401 Water Quality Certification for USACE NWPs and must determine if the NWPs adequately protect Waters of the State for activities applicable under the NWPs. They have determined that NWP 5 (LFA control actions) is a NWP for which water quality is certified, but NDEP must be notified of the activity through submittal of a 401 application to the Bureau. However, the Bureau has determined that 401 certification is denied without prejudice for NWP 27, and 401 projects falling within that permit must be evaluated individually, at which time they may or may not be certified. NWP 27 projects must apply for a 401 certification with applications submitted to the Bureau for review. Those projects will be issued a formal notice certifying the project, waiving the 401, or denying the certification.

1.6 OTHER STAKEHOLDERS ~~REVIEWING AGENCIES AND ENTITIES~~

The ~~agencies~~ **stakeholders** listed are members of the NAWWG or advisory committee, are collaborators on the Lake Tahoe Region AIS Action Agenda, and have been involved in the project planning process. Other reviewing ~~agencies~~ **stakeholders** include:

- California Department of Food and Agriculture (CDFA)
- Lake Tahoe AIS Coordinating Committee (LTAISCC)
- Lake Tahoe AIS Working Groups (LTAISWGs)
- League to Save Lake Tahoe
- Natural Resource Conservation Service (NRCS)
- Nevada Department of Agriculture
- Nevada Department of Wildlife (NDOW)
- Nevada Division of State Parks
- Tahoe Area Sierra Club
- Tahoe Interagency Executive Committee
- Tahoe Keys Property Owners Association (TKPOA)
- Tahoe Science Consortium (TSC)
- Tahoe Water Suppliers Association (TWSA)
- University of California Davis – Tahoe Environmental Research Center (TERC)
- University of Nevada at Reno (UNR)
- U.S. Coast Guard (USCG)
- U.S. Department of Interior (USDOI)
- Western Regional Panel

1.7 OTHER APPLICABLE REGULATORY PROGRAMS

The Lake Tahoe AIS Management Plan identifies existing authorities and programs applicable to the Project. In addition to NEPA, TRPA, and CEQA, Federal, state, and regional regulations and programs applicable to the Project include the following:

- Federal Endangered Species Act of 1973 (16 USC A. §§ 1531 to 1544)
- Federal Executive Order 13057 (July 26, 1997)
- Federal Executive Order 13112 (64 FR 6183, February 3, 1999)
- Lake Tahoe Federal Advisory Committee (LTFAC) (5 USC App. July 17, 1998)
- Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA) and National Invasive Species Act of 1996 (NISA)
- California-Nevada Compact for Jurisdiction of Interstate Waters
- Lake Tahoe Environmental Improvement Program

1.8 PUBLIC REVIEW PROCESS

The public review process for this project began with a public scoping notice describing the project location, desired condition, proposed activities, and how to participate in the scoping process. It was mailed to interested or affected parties on February 13, 2019, and requested response by March 15, 2019 (30-day period). A total of nine comment letters were received from the California Tahoe Conservancy, Tahoe City Marina, Sierra Club Tahoe Area Group, League to Save Lake Tahoe, California State Lands Commission, Nevada Tahoe Resource Team (NDSL, NDSP, and NDOW), Tahoe Yellow Cress Adaptive Management Working Group, Tahoe Water Suppliers Association, and the USDA Forest Service Lake Tahoe Basin Management Unit. The comments requested project area and project description clarifications, consideration of resource protection measures and mitigation measures (e.g., resource protection measures or RPMs), and addressed the purpose and need, project objectives, and potential resource impacts (See Appendix B).

Opportunities for public participation in the Environmental Review process are provided in order to promote open communication and better decision-making. Persons and organizations having a potential interest in the Project are invited to provide comments during the 30-day comment period for this document.

Pursuant to the requirements of CEQA, this document was sent, along with a NOI to adopt an MND, to the California SCH. During a 30-day public review period from August 17, 2020 to September 16, 2020, federal agencies, state agencies, local agencies, and the general public have the opportunity to review and comment on this document. Distribution of this document occurred through public clearinghouses, public noticing on the Tahoe RCD website, local public repositories, and direct mailing to interested agencies and parties.

Pursuant to the TRPA's Rules of Procedure and Chapter 3 of the TRPA Code of Ordinances, the agencies IEC will be made available for public review along with the project staff report at least seven days prior to hearings held to consider the proposed Project.

This Project is subject to comment pursuant to 36 CFR 218, Subparts A and B. This project is subject to the pre-decisional Forest Service objection process (36 CFR 218.5). Only those who submit timely project-specific written comments during a public comment period are eligible to file an objection. The LTBMU will accept comments on this draft EA for 30 days following publication. It is the commenter's responsibility to ensure timely receipt of comments (36 CFR 218.25)

The public will also have opportunity to comment at the scheduled Tahoe RCD Board meeting in October when the CEQA findings are considered by Tahoe RCD Board for the MND approval.

The Draft MND and IEC Certification are included in the front of this document. These documents will be updated as needed to address comments received during the 30-day comment period. Written comments should be sent to Tahoe RCD or TRPA at the contact information listed below:

Tahoe Resource Conservation District
Mollie Hurt, Director of Programs
870 Emerald Bay Road, Suite 108
South Lake Tahoe, CA 96150
(530) 543-1501 ext. 102 (phone)
mhurt@tahoercd.org

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Paul Nielsen, Special Projects Manager
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Stateline, NV 89449
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pnielsen@trpa.org

SECTION 2 PROJECT DESCRIPTION

2.1 PROJECT OBJECTIVES

The annual objectives of the Project are to support the Lake Tahoe Region Aquatic Invasive Species Action Agenda by:

1. Limiting the spread of existing AIP in the Region by employing strategies that minimize threats to native species, and extirpate existing AIP populations when possible; and

2. Contributing to the abatement of harmful ecological, economic, social, and public impacts resulting from AIP.

Control actions will utilize the most effective methods at high-priority sites and will include maintenance activities at sites that have been treated previously.

2.2 NO ACTION ALTERNATIVE

The No Action Alternative will serve as a baseline condition against which the Proposed Project Alternative is compared for determination of potential direct, indirect, and cumulative effects. The No Action Alternative represents the foreseeable future in Lake Tahoe without the Project conditions. Therefore, the No Action Alternative would continue to implement only those control methods previously adopted in the 2014 Lake-wide Aquatic Invasive Plant Control Project (hand removal, diver-assisted suction removal, and benthic barriers) and implementation would remain limited to those areas identified in the 2014 Lake-wide Aquatic Invasive Plant Control Project, specifically only Lake Tahoe and a portion of the Truckee River. No AIP control would occur in the marshes or tributaries to Lake Tahoe, and the existing habitat and water quality where AIP infestations occur in those areas would not be restored.

2.3 PROJECT AREA AND CONTROL SITES

The Project is located in the Lake Tahoe Region, and the project area is composed of suitable habitat areas within the Lake Tahoe Region including the Lake itself, tributaries, and adjacent marshes of Lake Tahoe and the Upper Truckee River and Truckee River as they flow into and out of Lake Tahoe, respectively, within TRPA's jurisdiction (see Figure 2-1). The project area does not include the channels and lagoons of the Tahoe Keys as a separate analysis of treatment methods is occurring due to the significant differences in scale and complexity. Suitable habitat is present in Lake Tahoe within the City of South Lake Tahoe and El Dorado and Placer counties in California and Carson City, Washoe, and Douglas counties in Nevada. Within this large project area, several control sites have been identified for potential control methods based on existing knowledge of AIP presence. New control sites within the project area are anticipated to be identified by Tahoe RCD and its implementing partners as a result of monitoring, and these control sites and the implementation of control methods could occur anywhere within the entire project area.

The Project Area includes areas within the lakeshore, nearshore and backshore of Lake Tahoe, tributaries and marshes that provide ideal growing conditions, such as shallow waters, for establishment of submerged AIP. In order to quantify potential aquatic plant control requirements within Lake Tahoe, the Lake Tahoe Region AIS Action Agenda (Action Agenda) identifies areas of suitable habitat based on the best available bathymetry data. Figure 2-1 depicts suitable habitat within Lake Tahoe for AIP establishment, which forms the project area.

Control sites are smaller, localized areas within the greater project area, where AIP control methods are applied to a specific infestation site. The Action Agenda has identified and prioritizes which control sites are to have action taken within them and which control actions are appropriate for the control site based on the size of the infestation, depth, presence of native vegetation, access, and other factors. While some locations have already been identified as control sites in the Action Agenda, other locations within the project area will be proposed as control sites if infestations are detected during future lake-wide plant detection surveys/monitoring.

2.3.1 Project Area

The Project area includes the waters of Lake Tahoe, each Lake Tahoe marina, tributary waters adjacent to their confluence with Lake Tahoe, and marsh areas located along the tributaries (examples include marshes near Edgewood Creek in Nevada and General Creek in California). As shown on Figure 2-1, the Project area includes three distinct types of suitable habitat areas: 1) the entire lakeshore area of Lake Tahoe to a depth of 11 meters below the lake rim, including marinas; 2) marshes, and 3) tributaries to lake, specifically within a 50-meter (164-foot) buffer of the stream and within 500 meters (1,640 feet) of the natural rim of the lake or extended to the 6,253-foot elevation contour, whichever is greater. Tributaries are unlikely to contain AIP above that distance or elevation. The Upper Truckee River portion extends approximately 6 miles from the lake to Lake Tahoe Airport, exceeding the distance and elevation limit in order to capture the extent of potential habitat in this area. The Truckee River portion is about 5 miles long with an average width of 40 feet or an estimated 24 acres of potential habitat in the linear river system. The Project Area encompasses approximately 15,608 acres of suitable habitat in the Tahoe Region. As shown in Figure 1-2, the Project area includes Federal, state, and locally-managed areas.

<u>Lakeshore:</u> Submersed aquatic plant habitat includes areas within the lake from the natural rim of Lake Tahoe (6,223-foot elevation) to 11 meters (36 feet) below the natural rim of Lake Tahoe, which is the AIP survival depth. As shown in Figure 2-1, this area narrows and widens within the lake based upon lake bathymetry. While some areas extend some distance into the lake, such as near Tahoe City and the City of South Lake Tahoe, other areas are close to the shoreline, such as the area near D.L. Bliss State Park and the Timberland/Ward Creek area.

<u>Tributaries:</u> Figure 2-1 also depicts potential submersed aquatic plant habitat within tributaries connected to Lake Tahoe. Potential habitat within the tributaries fall within a 50 meter (164-foot) buffer of the stream channel and extend 500 meters (1,640 feet) from the natural rim or to the 6,253-foot elevation contour, whichever is greater. While some tributaries experience a substantial elevation change within a relatively short distance, others do not and those tributaries can extend for longer distances at a lower rate of elevational change. These distance limits were chosen because they represent the limit where it is unlikely, with high lake level, that AIP fragments would extend into the tributary due to distance with elevation. Since most of these tributaries flow into Lake Tahoe, plant fragments would not be carried up the tributary by currents, therefore the 500 meter (1,640 feet)/6,253-foot elevation is considered an appropriate limit. Tributaries that have gentle elevation change and extend past the 500-meter (1,640-foot) limit include Bijou Creek, the Upper Truckee River, and the Truckee River. Meeks, Tallac, Taylor, Burke, Edgewood, and Bijou Creeks, as well as some others, extend well beyond 500 meters (1,640 feet) from the Lake Tahoe's natural rim prior to reaching the 6,253-foot elevation.

As shown on Figure 2-1, the Truckee River outlet habitat area extends to the TRPA Region boundary. The Truckee River is the sole outlet of Lake Tahoe and drains part of the high Sierra Nevada, emptying into Pyramid Lake in the Great Basin. The Middle Watershed is regarded as the 15 miles (24 km) of river and its tributaries from Tahoe City in Placer County, through the Town of Truckee in Nevada County, to the state line between Sierra and Washoe counties. Since water flows out of the lake at this point, the potential for plant fragments to be carried downstream is higher than in other tributaries. This Project will be implemented along a 5-mile section of the Truckee River from the dam at Lake Tahoe in Tahoe City to the TRPA Region boundary. This Project falls within Placer County jurisdiction and is contained within the boundary of the Lake Tahoe Region as defined by TRPA. As such, it is included in the Lake Tahoe Region AIS Management Plan. This is a section of the river that is heavily used for recreation, including whitewater rafting and fly-fishing. The largest tributary area in the Project area is along the

Upper Truckee River, which extends past the Lake Tahoe Airport to US Highway 50 near Elks Club Drive. This area includes an array of interlinking tributaries, stretching for long distances at a slow rate of elevational change. Figure 2-1 shows this habitat area extending beyond both the 500 meter (1,640-foot) and 6,253-foot elevation due to the presence of marsh and potential AIP spread through non-motorized recreational users accessing the Upper Truckee River further upstream. Like the Truckee River, the Upper Truckee River is also well-used for recreation, increasing the potential for invasive species to be brought into the area on recreational equipment.

Marshes: The third habitat type shown on Figure 2-1 identifies marsh areas connected to Lake Tahoe or its tributaries. Marshes provide warmer, slow moving environments for AIP to establish themselves. Marsh areas are mapped based on the extent of the marsh habitat, often extending outside the 6,253-foot elevational contour.

Although located within the TRPA Region boundary, constructed water bodies, such as Quail Lake or Lake Barron are not included in the Project Area because the Action Agenda does not prioritize upland water bodies, the process to evaluate cultural resources with the Forest Service in those areas would result in implementation delays, and the funding agreement between Tahoe RCD and CTC focuses on Lake Tahoe and the nearshore. The Tahoe Keys are also excluded from the Project Area because it is being studied under a separate control program by TRPA, Lahontan, Tahoe Keys Property Owners Association and the other AIP control partners.

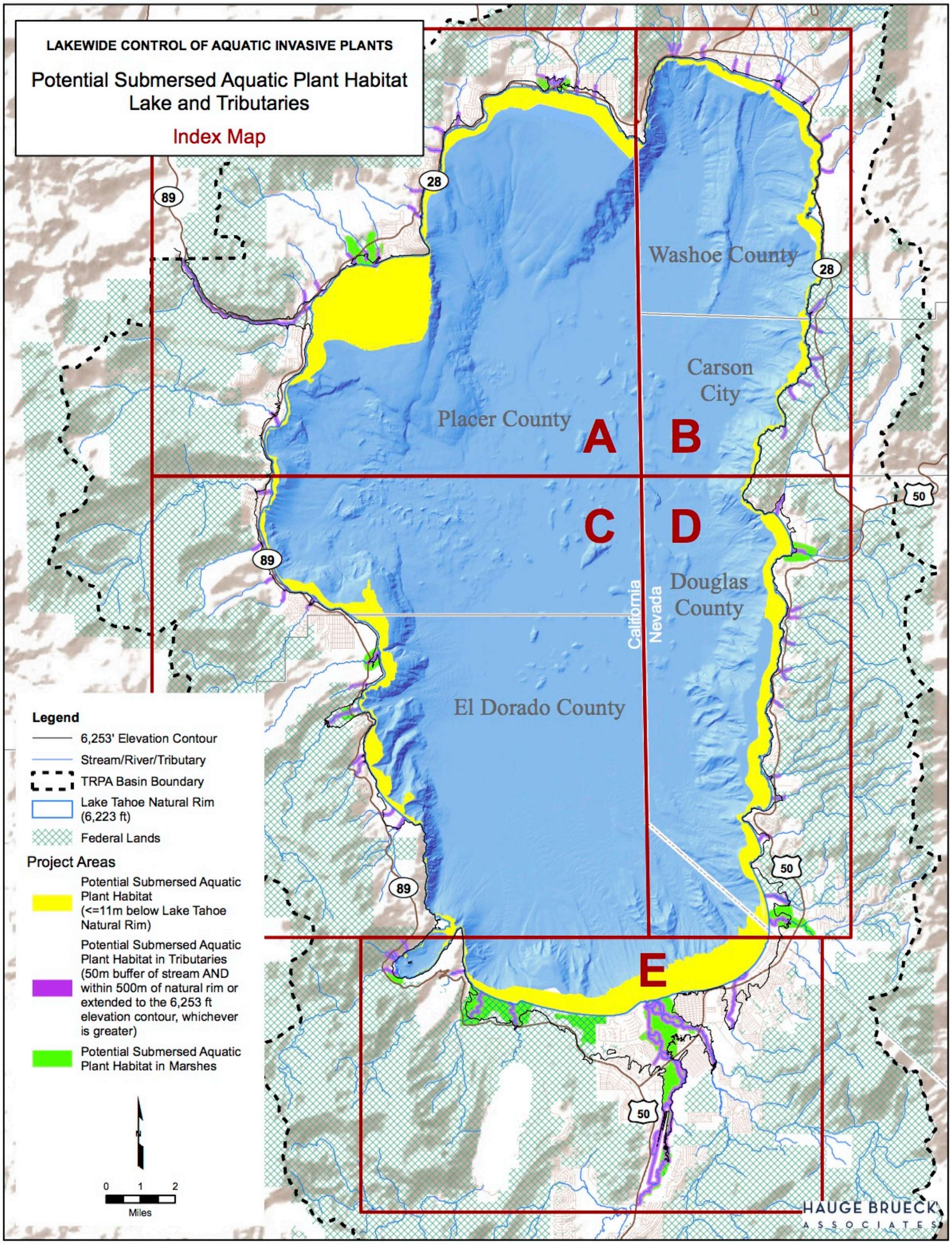
2.3.2 Control Sites

Control sites are smaller, localized areas within the greater project area, where AIP control methods are applied to a specific infestation site. New control sites within the project area are anticipated to be identified as a result of monitoring, and these control sites and the implementation of control methods could occur anywhere within the entire project area. Within the project area, aquatic plant surveys conducted from 2005 through 2019 have documented plant infestations at forty-nine locations around Lake Tahoe, which are documented as distinct infestation control sites. Control sites that have been identified as known infestations are shown in Figure A-2 and listed in Table A-1 in Appendix A. Prior work has shown that for successful management, known and new infestations of AIP must be addressed comprehensively and repeatedly. This Project will establish annual prioritization criteria for plant infestation control as described in the Lake Tahoe Region AIS Action Agenda. The Action Agenda prioritizes control sites as Tier 1, Tier 2, Early Detection Rapid Response (EDRR)/Surveillance locations, and Historic.

As stated in the Action Agenda, Tier 1 locations are the highest priority based on their location at the upper portion of the Tahoe watershed, the size of the AIP infestation, their connectivity to one another, and the existence of other associated AIS (e.g. invasive fish), the projected extent of ecosystem benefits to be achieved (e.g. multiple benefits), and the perceived high risk to ecological integrity. Tier 1 locations are subdivided into three categories: ranging from A (highest priority) to C (lowest priority). Tier 1A control sites include Meeks Creek, Pope Marsh, Tahoe Keys Main Lagoon, Tahoe Keys Channels Complex, Taylor and Tallac Creeks, Upper Truckee Marsh and the Upper Truckee River. Tier 1B control sites include Edgewood Creek and Pond Complex, Lakeside Marina, Ski Run Marina, and Ski Run Channel. Tier 1C control sites include Baldwin Beach, Camp Richardson Pier, Elk Point Marina, and Timber Cove Pier.

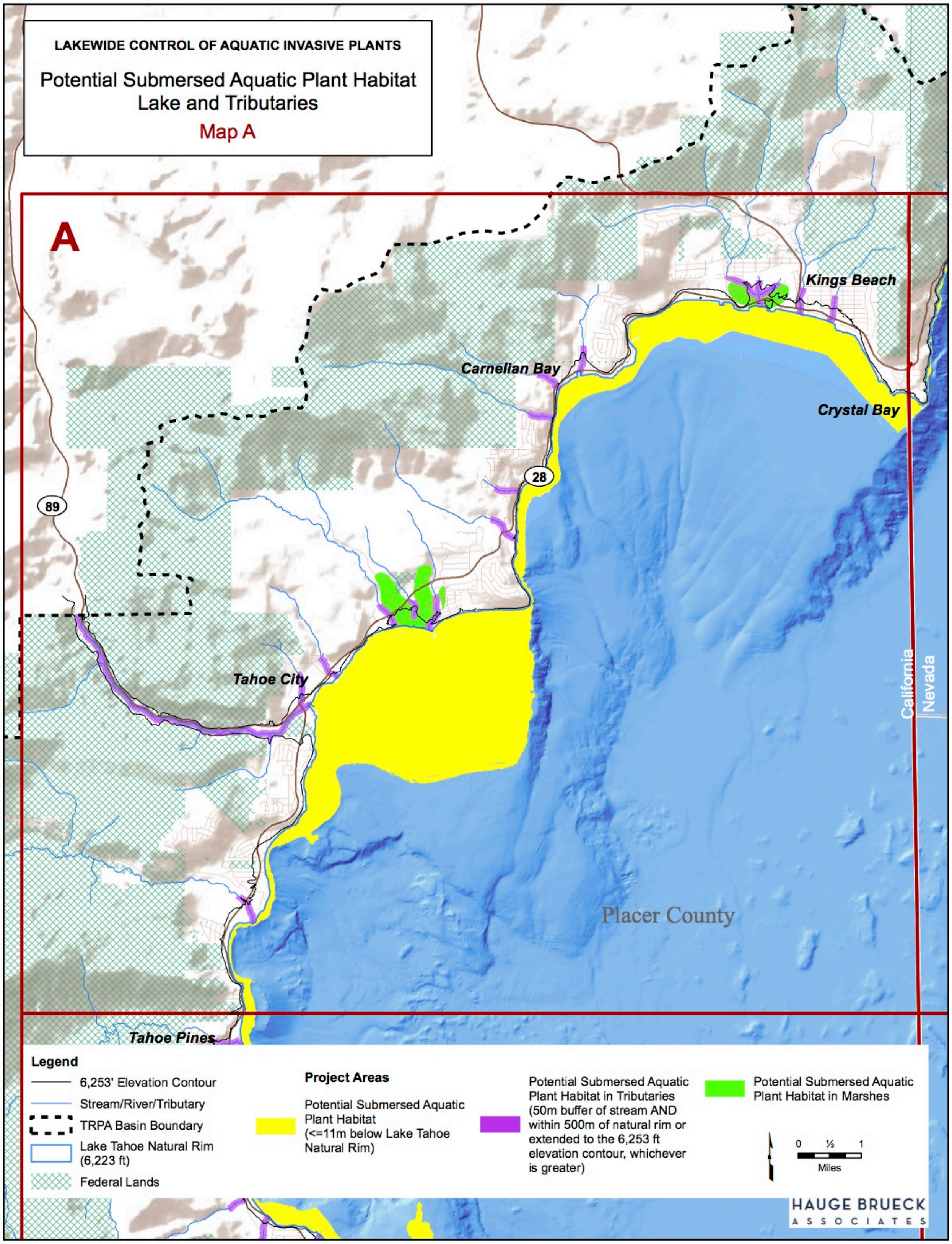
Tier 2 locations are secondary priorities primarily because of the smaller size of the infestation relative to Tier 1 locations. In addition, these locations are not located on the south shore of Lake Tahoe, and are not as well connected to other infested sites. Tier 2 control sites include Burke Creek, Elk Point and Round Hill shoreline, General Creek, Logan Shoals Marina, Lower Truckee River below the dam, Regan Beach, Tahoe Beach Club, and Wovoka Estate Marina.

Figure 2-1. Project Area: Potential Habitat for Submerged Aquatic Plants Index Map



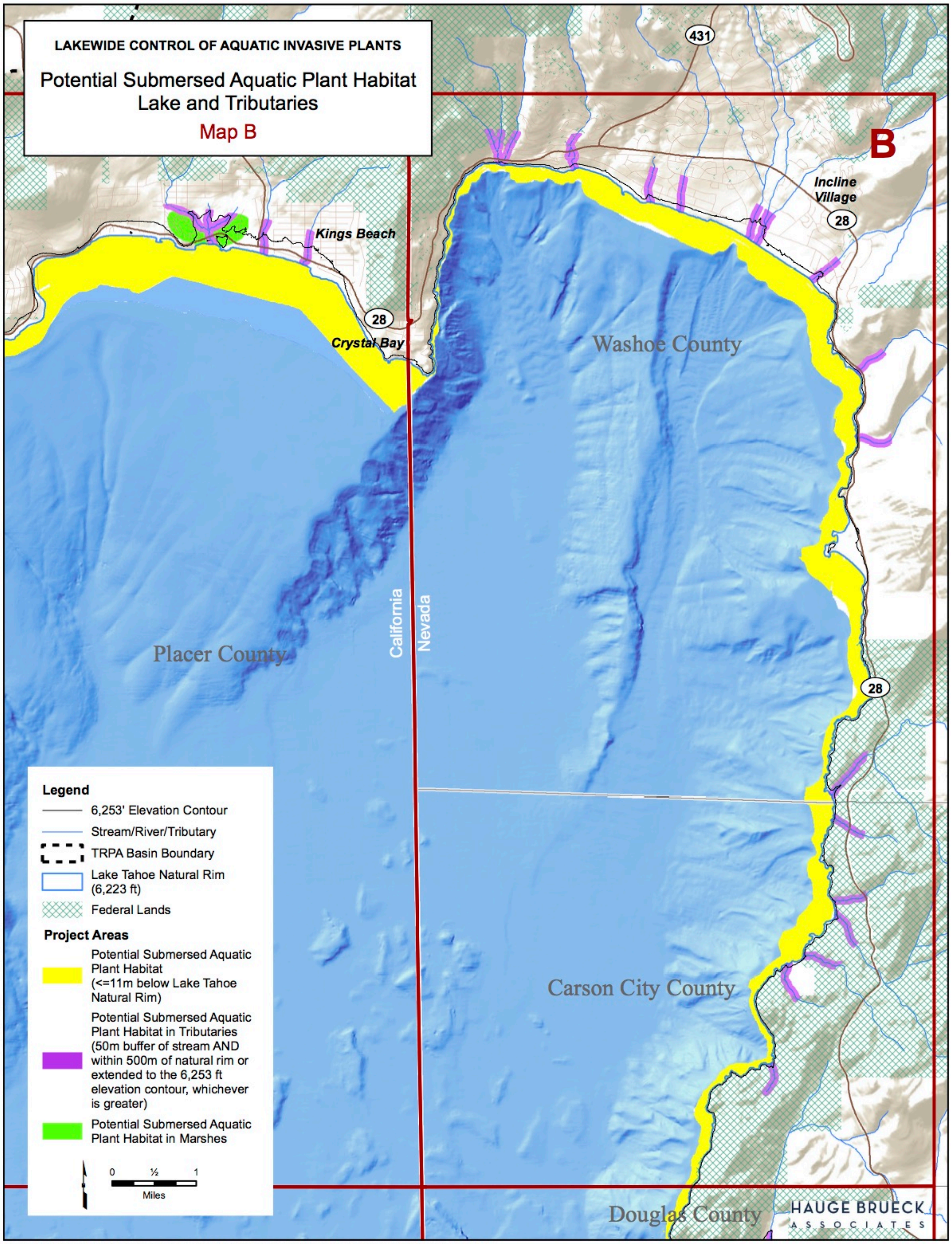
Sources: ArcGIS Online shaded relief map service; TRPA; Tahoe Resource Conservation District. Map date: June 25, 2019. Revised: May 4, 2020.

Figure 2-1a. Project Area: Potential Habitat for Submerged Aquatic Plants Map A



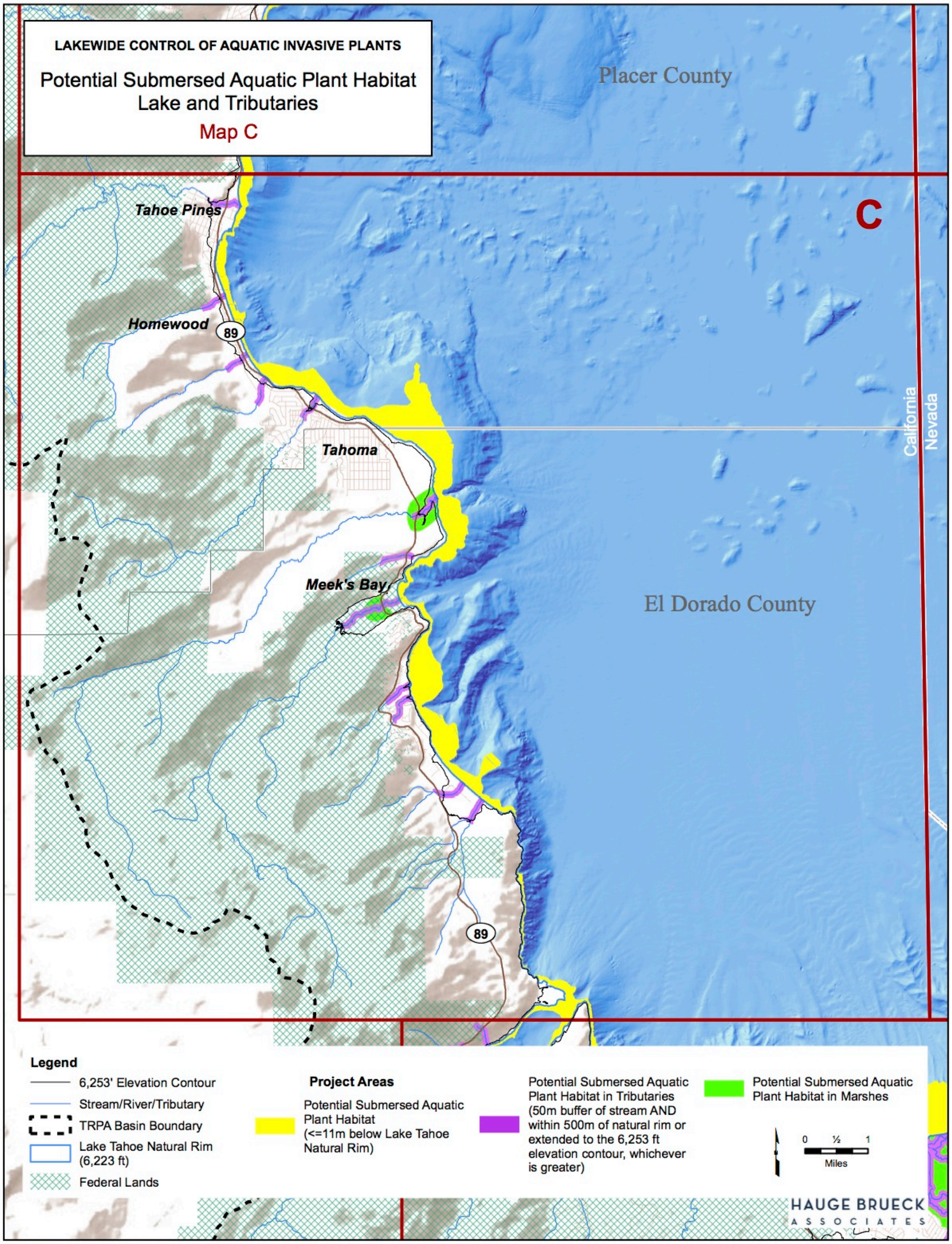
Sources: ArcGIS Online shaded relief map service; TRPA; Tahoe Resource Conservation District. Map date: June 25, 2019. Revised: May 4, 2020.

Figure 2-1b. Project Area: Potential Habitat for Submerged Aquatic Plants Map B



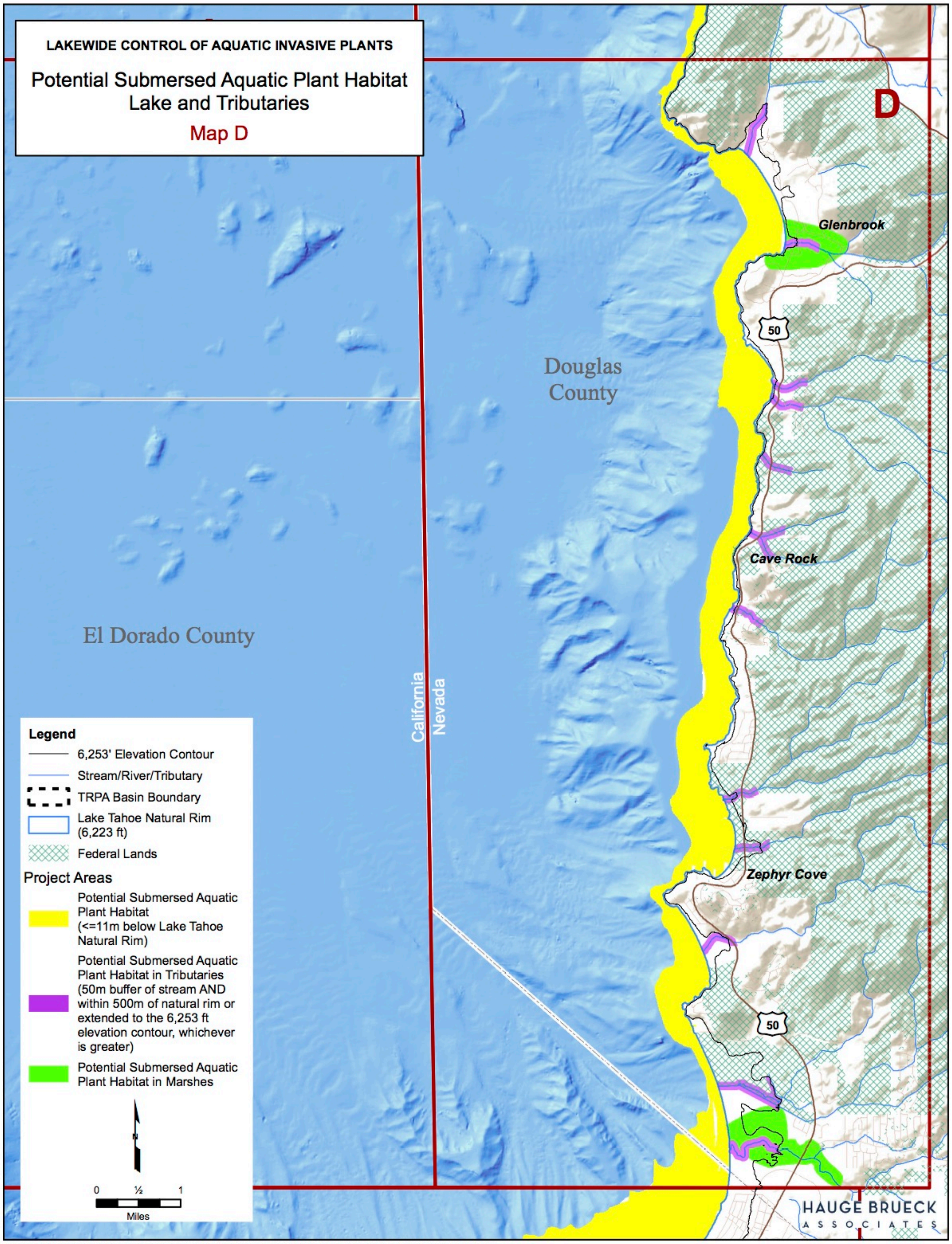
Sources: ArcGIS Online shaded relief map service; TRPA; Tahoe Resource Conservation District. Map date: June 25, 2019. Revised: May 4, 2020.

Figure 2-1c. Project Area: Potential Habitat for Submerged Aquatic Plants Map C



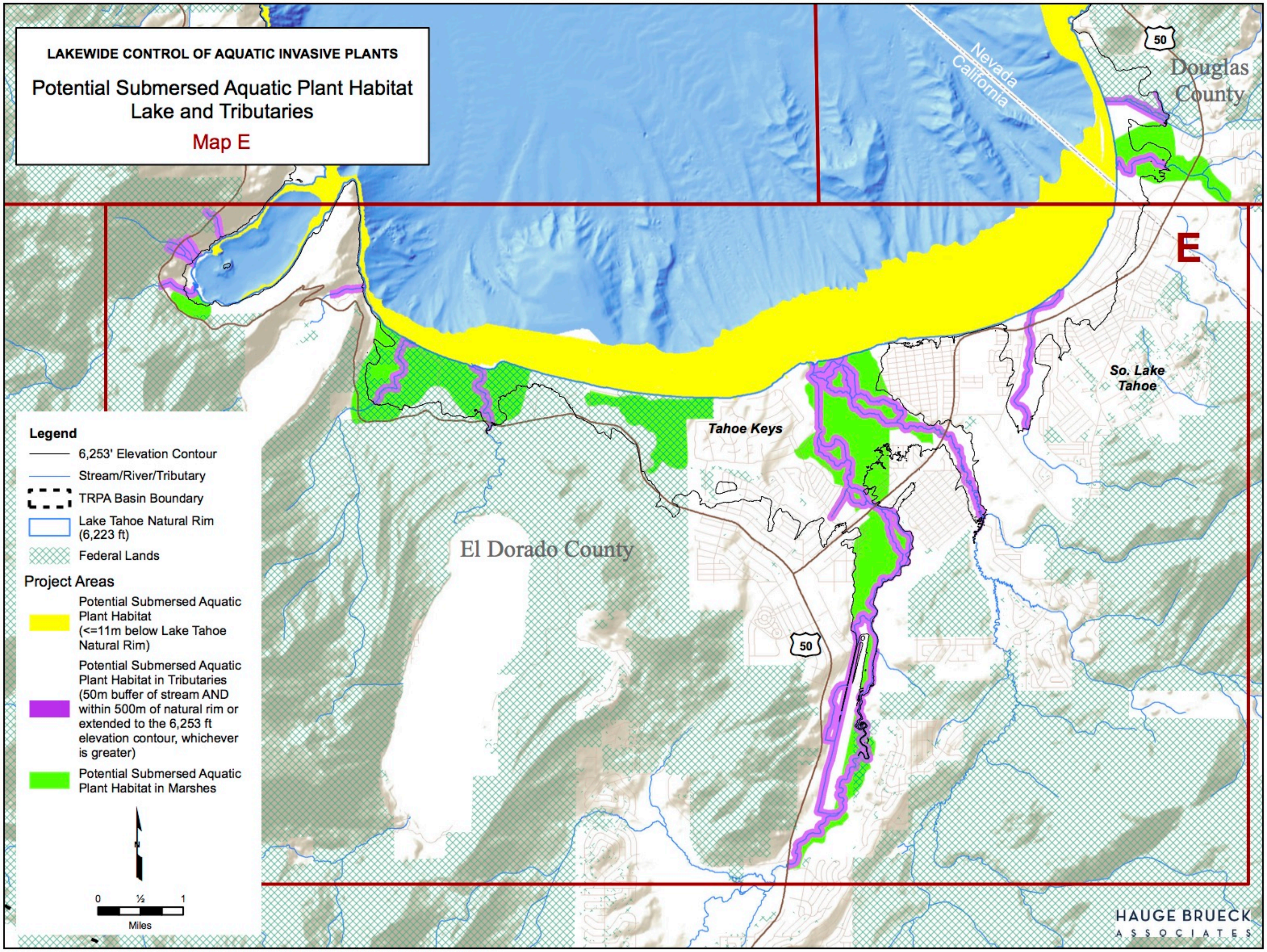
Sources: ArcGIS Online shaded relief map service; TRPA; Tahoe Resource Conservation District. Map date: June 25, 2019. Revised: May 4, 2020.

Figure 2-1d. Project Area: Potential Habitat for Submerged Aquatic Plants Map D



Sources: ArcGIS Online shaded relief map service; TRPA; Tahoe Resource Conservation District. Map date: June 25, 2019. Revised: May 4, 2020.

Figure 2-1e. Project Area: Potential Habitat for Submerged Aquatic Plants Map E



Sources: ArcGIS Online shaded relief map service; TRPA; Tahoe Resource Conservation District. Map date: June 25, 2019. Revised: May 4, 2020.

Early Detection Rapid Response (EDRR)/Surveillance locations are a type of control site that have either been treated and/or are under surveillance because of past infestation, or because of the likelihood of future infestation given the parameters of the site (high boater recreational use, proximity to infested locations, etc.). Monitoring these sites on an annual basis to assess the status of any AIS infestation is critical. EDRR funds should be dedicated and used on an annual basis to control documented infestations at these locations and any new locations in the region. EDRR sites include: Crystal Shores East, Crystal Shores Villas, Crystal Shores West, Emerald Bay, Avalanche Beach, Vikingsholm, Parson's Rock, Fleur du Lac Marina, Glenbrook, Nevada beach, Star Harbor, Sunnyside Marina, Tahoe City Dam, Tahoe Tavern, Tahoe Vista boat ramp, and Zephyr Cove.

2.3.3 Staging and Access Locations

The staging areas will depend on the methods used for removing the AIP and control site location. Whenever possible access and staging will occur from a pier, parking lot, or existing developed area. At times control site location may necessitate that access and staging areas be located on the lake shore and beach.

Staging areas will also be used to temporarily store control equipment during implementation. For example, benthic barrier mats and rebar staples may be stored within a staging area prior to or following use. Other equipment within the staging areas may include generators, diving equipment, safety signage and barriers, and piping for LFA systems, among other materials. Large equipment refueling would occur offsite or at area marinas where fuel is already available, and small equipment fueling may occur in paved staging areas with small quantities of fuel stored in hand-held certified fuel storage containers. Piers, enclosed marina structures, and area parking lots may be used for staging.

As discussed under Section 2.4.3, staging areas and access points will avoid and protect populations of Tahoe yellow cress and, will coordinate with appropriate personnel so that staging areas will not interfere with normal recreation operations where feasible.

2.4 PROPOSED PROJECT / PROPOSED ACTION

The Proposed Project / Proposed Action (Project) would control invasive aquatic plants within the identified project area using control measures appropriate for each area of infestation within the project area (control site). The Project would implement the AIP control components of the Action Agenda through different types of direct and indirect control methods and followed by associated monitoring/surveillance activities applied to each control site. The Action Agenda decision-making team will determine which method or methods are best suited to each control site, taking into account the characteristics of the control site, breadth of infestation, access, cost, and other factors. Direct control methods are actions that directly target AIP removal and function only to remove AIP, such as hand pulling, diver-assisted suction removal, benthic barriers, UV-C light methods, suction dredging, and mechanical dredging. Indirect control methods include actions that control either the spread of AIP or alter the conditions of the water to discourage AIP growth (LFA). In all cases, AIP monitoring will occur to support and implement the early detection and rapid response activities in the Action Agenda and to monitor for new AIP populations and track removal success.

Table 2-1 discusses the appropriate location in which each control method may be applied, and the associated permits required per method and location. Permitting requirements per control method are provided in Figure 2-2. Tahoe RCD and its agency partners will apply for the permits needed to use the approved control methods on a Project-Wide (Basin-wide) scale.

The typical summer AIP control schedule includes reconnaissance surveys of potential control sites in May and follow up surveys in late Fall. Control activities occur throughout the summer.

Economic details pertaining to the control methods are discussed in the Action Agenda. This document supports the Action Agenda by evaluating the environmental impacts of those actions discussed in the Action Agenda; however, the Action Agenda establishes the strategy and approach, and is the process by which individual project level decisions are made, including financial decisions.

As discussed in Appendix A, control methods implemented in the past include hand pulling, diver-assisted suction removal, benthic barriers, and inadvertently through marina maintenance dredging. These methods would continue to be used, along with newer methods such as UV-C light treatment and LFA devices. The Project also proposes the use of suction and mechanical dredging specifically for AIP control outside of marina-proposed maintenance dredging; however, dredging proposed for AIP control would be limited to areas in which maintenance dredging has previously occurred and to the extent and depth of previously authorized dredging to avoid expansion or disturbance of new areas.

2.4.1 Direct Control Methods

Direct control methods are actions that directly remove AIP, either through removal of individual plants and their root system, covering plants to starve them and cause their failure, or through processes that alter cell structure of the plant and causing the plant to fail. These methods include the use of benthic barriers, hand removal, diver-assisted suction removal, and UV-C/Light treatment, suction dredging, and mechanical dredging.

2.4.1.1 Benthic Barriers

Benthic barriers or “bottom barrier” control consists of placing sections of gas permeable, black landscape cloth, plastic, jute, or other material, over the top of submerged vegetation to exclude light. Figure 2.4.1-1 shows images of benthic barriers in active use. The Lake Tahoe AIP control program and its partners currently own 250 barriers. The barriers can range in size from 10-foot by 10-foot squares to strips of 10-foot by 40-foot or more and can cover up to 300 square feet with overlapping of barriers by 10% to achieve full coverage. The size of the barrier is dependent on the logistics of deploying, retrieving, and maneuvering in and out of the water. Synthetic barriers are held in place with re-bar u-stakes/staples, gravel **or sand** bags, or available natural debris. **Fill material used to secure barriers that is not sourced from Lake Tahoe should consist of clean washed sand or gravel. And no material passing through the #200 sieve size when performing a particle size distribution test should be used to fill the bags. Finally, the bags shall be biodegradable if they will not be recovered. Fill materials collected from Lake Tahoe do not have to be removed and washed, nor subjected to test for particle size.** Re-bar staples are removed when the synthetic barriers are removed. Synthetic barriers remain in place for a minimum of 2 to 4 months and are either removed from the lake or moved to a new location~~, typically immediately adjacent to the site just treated~~. Natural fiber (e.g. jute) barriers are placed over the growing plants and **may be** left in place ~~until~~ **if evidence shows that** the barriers decompose – **otherwise** they are ~~not~~ removed from the lake bottom. **If jute or a plant-based material is used, the Project proponent shall certify that the source of the material is certified AIP free.** If necessary, ballast such as iron rebar is used to hold the natural fiber barriers in place and **are removed once treatment is complete at that project site** ~~left on the lake bottom until the barriers decompose~~. Where there is sufficient natural debris on the lake bottom, the debris can be placed and left on the barriers to hold them in place. The average deployment time for bottom barriers is 20 to 25 barriers/day for a 4 to 6 person dive crew, which is the equivalent of approximately one fifth of an acre per day.

Barriers have been used successfully where plant growth is dense, usually greater than 50% density, and is less time and effort intensive than other control methods over large areas. Benthic barriers can be used in open waters, marinas, tributaries, and marshes, and will be deployed to high priority areas of dense plant growth. Following barrier placement, diver-assisted hand removal will be conducted to achieve 99%-100% plant removal at the perimeter of the barriers. In large areas or areas with tall masses of AIP, the AIP is harvested by cutting, trimming, or pulling prior to installing the barriers to reduce biomass. The harvested AIP are removed offsite for disposal and the treated area is heavily skimmed to plant remove fragments. Sediment curtains may also be temporarily used if necessary. The actual area of lake bottom covered by barriers each year would be determined by plant growth, funding, and other site-specific project constraints.

Figure 2.4.1-1. Photographs of Benthic Barriers in Use

Benthic barrier array in the Tahoe Vista boat launch

Benthic barriers in the Truckee River 2014-2015

Benthic barrier installed with rebar staples at Fleur du Lac Outer Harbor

Depending on site characteristics, plant composition, water temperature, and placement timing, synthetic barriers may need to be left in the water for 24 weeks during the growing season. In some areas with low wave action, barriers may be left in place longer than 24 weeks, such as over winter and through the following growing season to ensure no new growth emerges. Where motorized boating is allowed, control sites must have at least four feet of water depth to prevent damage to barriers or motorized boats, but barriers can be used in shallower waters where motorized boating is not allowed or feasible. This method also requires topside assistance for transport and installation of the barrier system. Little maintenance is required, although some “burping” of the barriers is required three to four weeks following installation to release gases produced be decomposing plants. If well cared for, barriers can be reused repeatedly.

Constraints to using this system include access, substrate conditions and presence of underwater structures or utilities, presence of fish spawning habitat, water column depth, land ownership, infestation area, and material availability as barrier inventory is limited and obtaining additional barriers is expensive. Benthic barriers can potentially impact recreation while in place, and temporarily affect access, water turbidity and dissolved oxygen, biomass, and habitat/native species, although the result would beneficially impact habitat quality.

2.4.1.2 Hand Pulling Removal

Hand pulling removal consists of simply removing vegetation from the water by hand and transferring it to garbage cans or bags for disposal. Hand pulling is accomplished with no mechanical equipment, typically in shallow waters, and is suitable where vegetation is less dense. Plants and their roots are pulled and collected for removal. This method can be accomplished with little disturbance, and can be used by divers when an infestation is sparsely, but widely distributed. This method can be used in high or low water levels but is less practical in areas of dense infestation due to the time required to remove each plant by hand. In suitable previously treated areas, hand pulling can help to maintain the area to prevent re-infestation. Skimmers can be used to collect plants and plant fragments created when plants are pulled from the bed/substrate. This method results in no impacts to water quality (other than temporary disturbance at the removal point), access and recreation, or biological resources, and has a beneficial impact on habitat quality and native species.

Hand removal can be considered a rapid-response action and is an effective control action for smaller AIP infestation areas (Kelting, D.L. 2007). Because implementation of this control action does not result in placement of fill or discharge to waters of the US/waters of the State, CWA Sections 404/401 authorizations are not applicable. The CDFW LSA/SAA agreement (Notification No. 1600-2014-0082-R2) approves Hand Removal actions for routine maintenance.

2.4.1.3 Diver-Assisted Suction Removal

Diver-assisted suction removal of plants is accomplished through the use of a small suction hose that is mounted on a floating work platform or on a boat. The suction is produced by a water injection system that uses a small 4-stroke gas powered engine. Attached to the engine is a water pump that pumps water from the lake into a water injector. A suction hose from the injector, usually between 3 and 6 inches in diameter, is used by a diver at the lake bottom to capture and transfer biomass to a catch basket on the work platform. Plants are collected by running the water though mesh bags or sieved baskets and returning the water to the Lake.

Qualified dive or snorkel crews will remove aquatic invasive plants by pulling the plant by the roots and feeding it into the suction hose and transferring the plant matter and associated water up to a conveyor system or collection box mounted on a boat or attached to a floating platform as shown in Figure 2.4.1-2. This method allows divers to remove all of the plant root mass. Screen material separates the plant material from the associated water, which passes through the screen and returns to the water column. Hand pulled fragments escaping the diver-assisted collection method will be removed by hand, net, or vacuum hose as reasonably practical before the close of each day. The plants that are captured in the screened-in container are transferred into garbage cans for removal and disposal offshore. The material will be collected at each control site staging area and then taken to a TRPA-approved disposal site, or at a site outside of the Region, where it is either disposed of or composted.

This method is used in areas where plants are growing in patchy, but dense distribution, and often used to remove new growth located outside of plant barriers. The effort required for diver-assisted suction removal of aquatic plants varies based upon the density of plant growth.

Constraints to using this method include access and land ownership, and the presence of fish spawning or native amphibian habitat. Temporary impacts associated with this method may include water turbidity, and minor access and recreation limits if/when diver-assisted suction removal equipment is used at access points, but with beneficial impact to habitat quality. This method can be used in high or low water levels (greater than 1 foot deep).

Figure 2.4.1-2. Photographs of Diver-Assisted Suction Removal

Diver with equipment on floating platform

Diver removing AIP from lakebed

2.4.1.4 UV-C/Light

New research indicates that using ultraviolet light (C wavelength also called UVC), a short-wave electromagnetic radiation light that damages the deoxyribonucleic acid (DNA) and cellular structure of AIP and their fragments, may be an effective method to kill and control AIP species, as laboratory tests resulted in complete mortality. The UV-C light control method involves the use of UV-C lamps that are assembled into an array or chamber mounted onto a vessel, as shown in Figure 2.4.1-3. When in use, the chamber of lamps drops down from the vessel, pushing vegetation down beneath the chamber platform. The lamps are arranged in the chamber so that they are within six (6) inches of the aquatic plants to be treated, and the chamber deflects taller plants downward to consolidate them under the chamber for treatment. The lethal range for ultraviolet light wavelength is between 200 and 280 nanometers, with the most effective wavelength at 254 nanometers. The lamps expose the plant cells to the high energy of the wavelength, and the plants absorb the energy into their DNA structure, which damages the cells of the plant by preventing cell replication. Once the cells are unable to replicate, the plant is destroyed and decomposes. The lamps operate for 5 to 20 minutes for effective control. Areas to be treated are split into a grid, with the vessel moving from grid to grid after each UV-C light control session. This system can include underwater cameras to scan the area prior to control implementation to determine if fish are present prior to starting treatment. If fish are present, the system can deploy acoustic, strobe light, or bubble curtain methods to temporarily deter the fish. UV-C light can be used in low or high lake levels as the light chamber is deployed to the depth needed (within six inches of the plant) and the ultimate depth is only limited by the mechanical reach or length of the chamber arm. Because the plants stop growing and fall to the floor into a mat over a 1 to 2-week period following treatment, and then slowly decompose over the next six to eight weeks depending on water temperatures and conditions, they are not immediately collected after exposure to the UV-C light; however, a skimmer may be used to collect plant fragments to expedite the process (Figure 2.4.1-3).

Treatment durations vary based on the number of grids to be treated and plant density. Based on laboratory tests and one pilot, low plants under 12 inches in height can be treated within 5 to 10 minutes, medium plants from 1 to 4 feet in height can be treated within 10 to 15 minutes, and tall plants over 4 feet in height can be treated within 15 to 20 minutes. Water clarity can also impact duration. Between 5 and 20 minutes are also needed to reposition the vessel between grids, depending on the site conditions, such as weather and boat traffic, and physical constraints, such as maneuvering within boat slips and around piers and other marina features. Dense, tall plants may require a second treatment three weeks following initial treatment to treat the sub-canopy that can become hidden by taller vegetation. Two days of site and equipment setup and inspection is followed by multiple days of treatment with intermittent days of cleaning the equipment and monitoring water quality. The 2018 Tahoe RCD Pilot Project Monitoring Report indicates that one acre of infestation could be treated within two to eight days depending on the size of the UVC array, the presence of obstructions such as slips, docks or underwater obstructions, and assuming work is not interrupted due to weather or other conditions that may force work stoppage. Plant density and the need for a secondary round of treatment may also affect the duration.

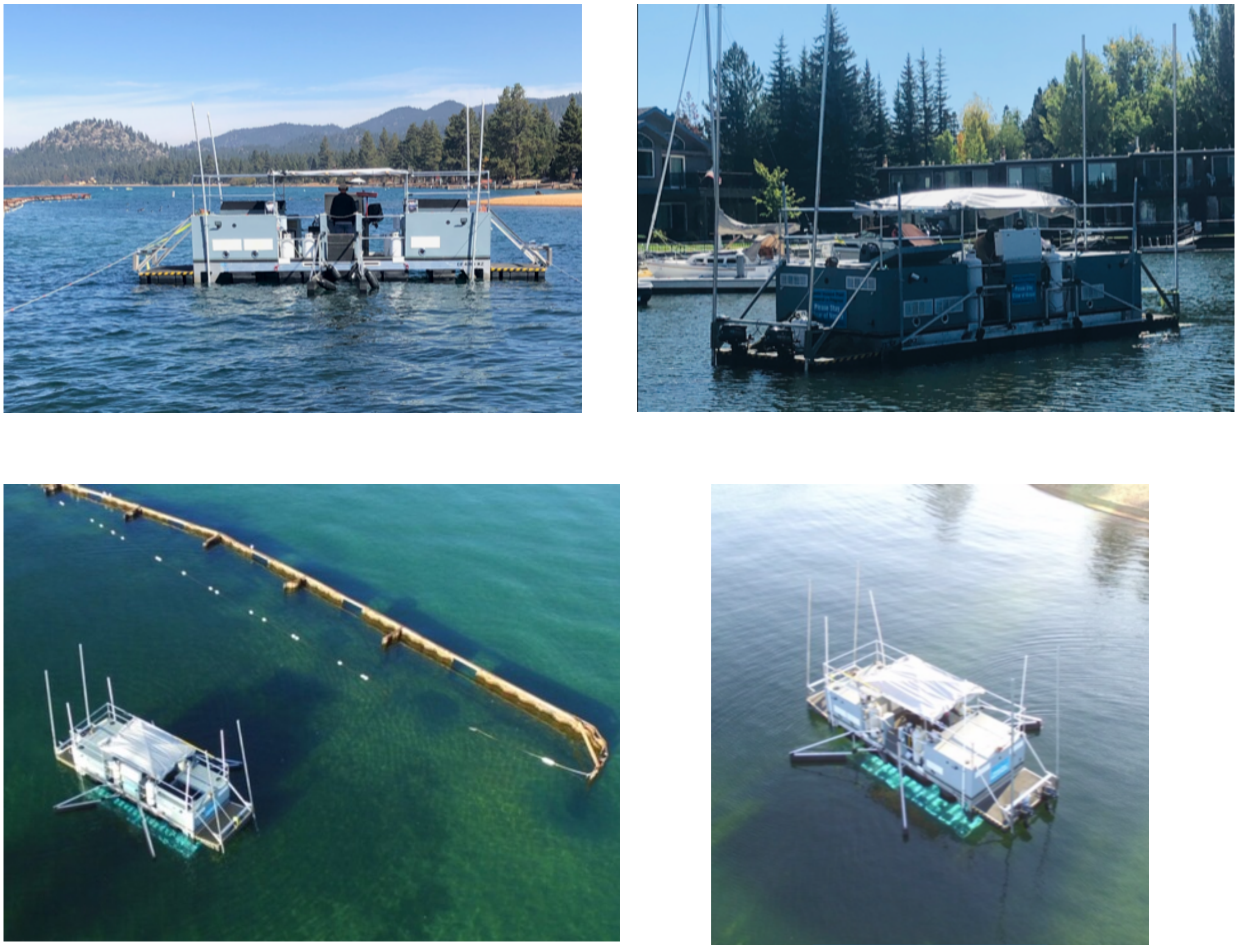
This method, proven very effective in laboratory trials and resulting in complete plant mortality, has been previously used at Lakeside Marina and Beach for marina and open water pilot testing using a barge equipped with a UVC light array chamber to determine its full potential as a new method to enhance and support current efforts in the control of AIP. Monitoring results indicated that the UV-C light was successful at controlling the leaves and stems, but did not penetrate the lake bed or sediment, which shielded the roots from UV-C light exposure; however, if the crown of the plant was effectively controlled, minimal new growth occurred from the root. UV-C light control is more effective early in the growing season when plants are shorter as large masses can shield smaller plants from treatment effects, and may require several phases of implementation in areas with mature or dense plant growth.

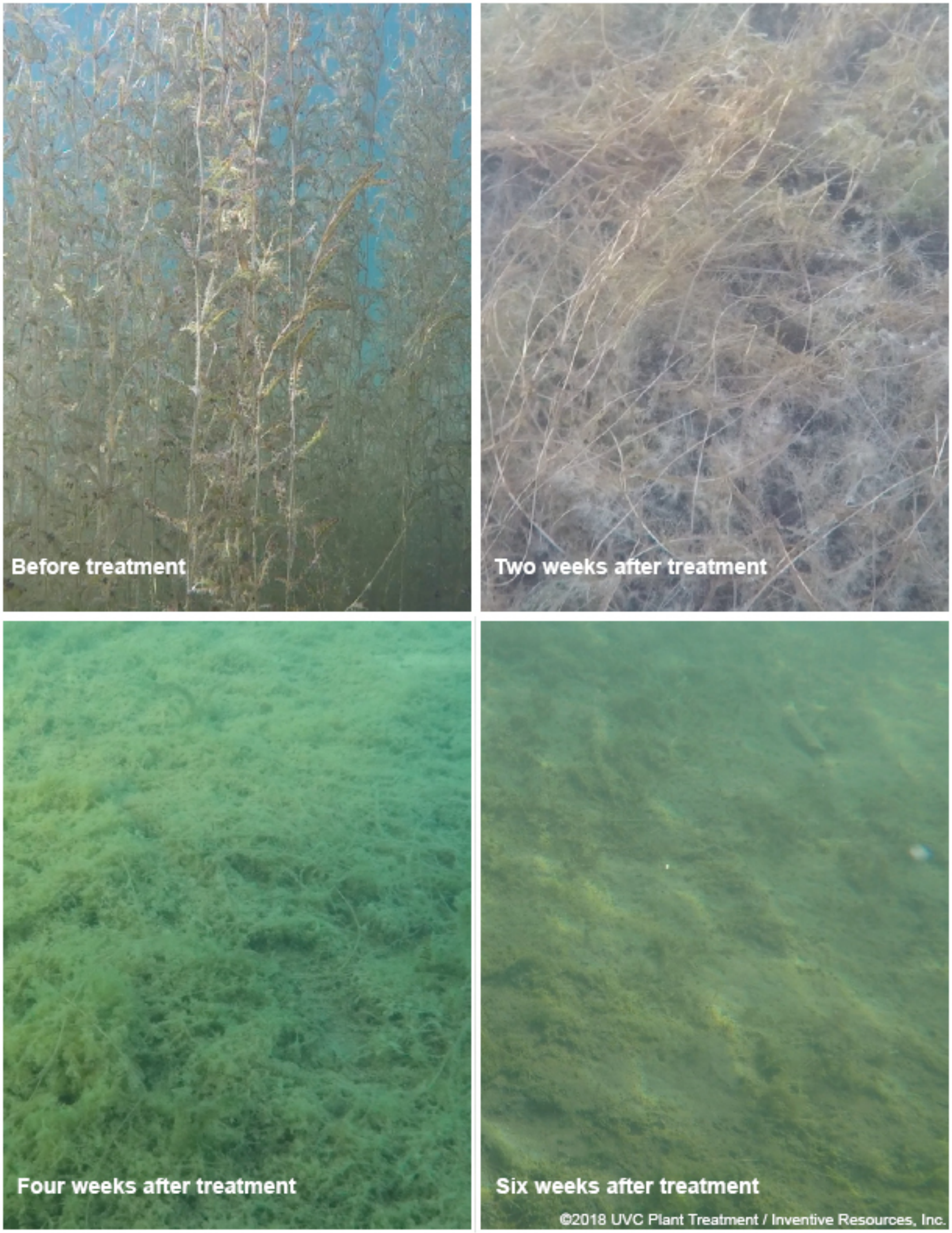
UV-C temperatures studies reveal that only slight changes in water temperature occur while the UV-C lamps are in use and dissipate rapidly. Inventive Resources, Inc., who operates the UV-C vessels, indicate that UV-C treatment can heat water at a level similar to the heat levels generated by a boat engine and is only a small fraction of the solar energy entering the water. The water under and around the array freely flows in and around the array and the heat from the UV-C lamps quickly spreads within a few minutes, to a volume estimated to be over four times the volume under the array or approximately 32-inches in height. An array at a ten-minute exposure time emits 81 British thermal units per square foot, which heats the water 0.5 degrees Fahrenheit for ten minutes; however, when depth and water mixing are taken into consideration, the resulting temperature increase is approximately 0.125 degrees Fahrenheit, which continues to rapidly dissipate. Over an hour, the temperature change would be near zero (Paoluccio, January 17, 2020).

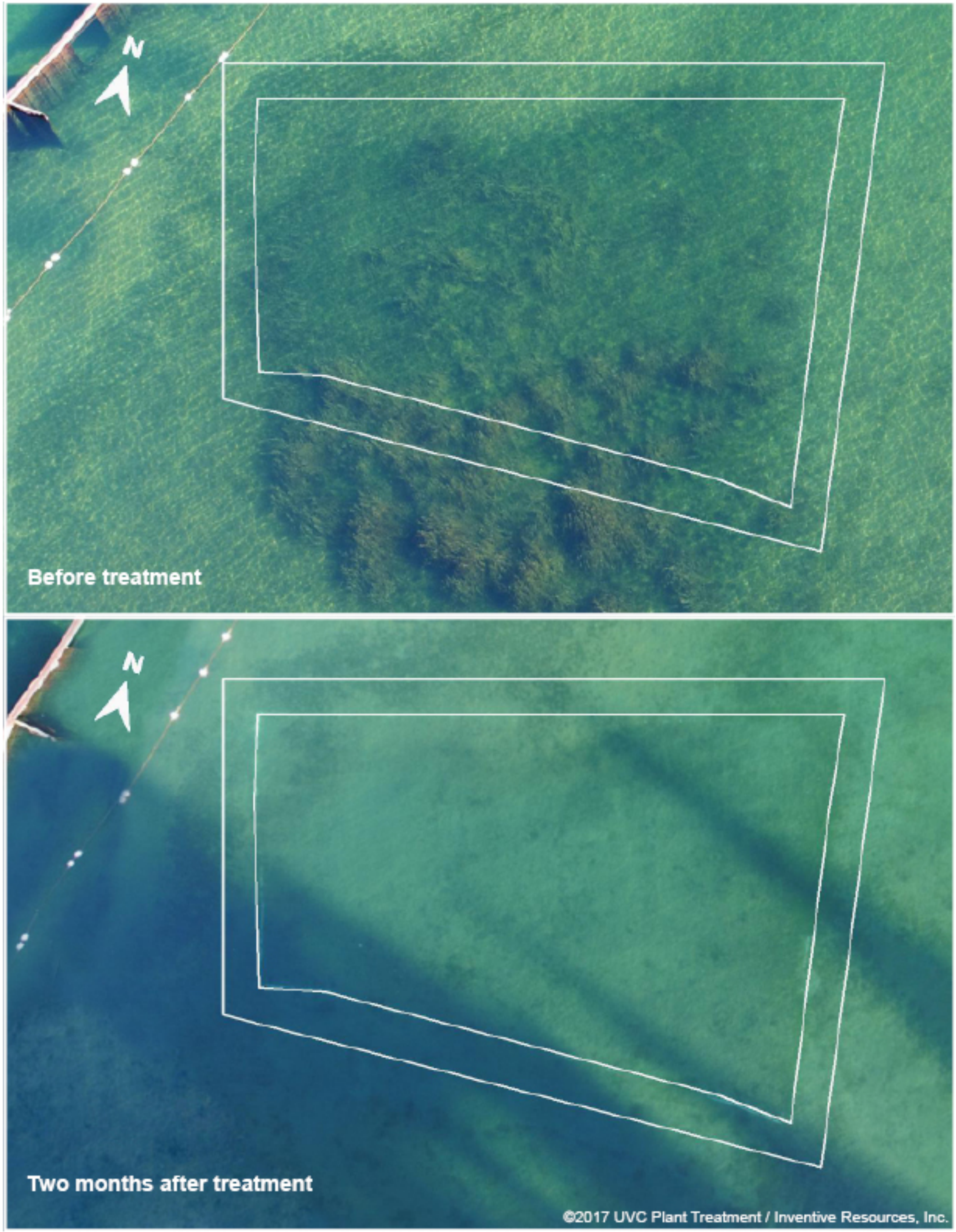
Results of the UV-C test study and any future studies will be used to refine the project methodology if needed and ensure the control method does not result in unintended consequences. The 2019 UV-C Light Plant Control Pilot Project Final Monitoring Report observed that the use of UV-C light control resulted in an immediate post-treatment increase in algae, that returned to lower levels over time, reduction or elimination of invasive plants over long-term periods, and an increase in native species over long-term periods. Additionally, the pilot project monitoring found that UV-C light may have a short-term effect on plankton and periphyton populations, but long-term post-treatment results did not indicate populations were eliminated. Chlorophyll levels appear to decrease over the long-term period after UV-C light is applied. High or low lake levels do not affect this control method as the chamber platform can be adjusted for depth, however windy weather and wave action can affect this method. It should be noted that since decomposition occurs over many weeks, nutrient release occurs slowly, and can be affected by various factors such as water temperature, weather, and recreational activities that affect water movement.

Use of this method can be constrained by access and land ownership, infestation density, water clarity, the presence of underwater structures, debris or utilities, and the substrate characteristics. Potential short term, adverse impacts associated with UV-C Light treatment include, recreation and access limitations, biomass volume, and plankton, algae, and chlorophyll reduction impacts. Potential beneficial impacts on habitat quality, fisheries, as it is natural control for invasive fish by reducing their reproductive success, and native species may also occur.

Figure 2.4.1-3. Photographs of UV-C/Light Control Method, Equipment, and Process




Before treatment
Two weeks after treatment
Four weeks after treatment
Six weeks after treatment
©2018 UVC Plant Treatment / Inventive Resources, Inc.



Source: Inventive Resources Inc. UV-C light control vessel (John Paoluccio, IRI, 2019)

2.4.1.5 Suction Dredging

Although not previously used by Tahoe RCD, marinas in Lake Tahoe have used suction dredging methods to remove vegetation and maintain marina access in the past (maintenance dredging). As a result, expanded use of dredging as a control method is proposed, but only where maintenance dredging has previously been permitted and completed~~, and only in small areas until more data supporting this methods success rate is generated~~. Suction dredging equipment would be used to remove the entire plant, root and supporting sediments, along with turions, with care taken to avoid leaving plant fragments in the water body, in conjunction with planned dredging activities. Dredging would be restricted to the depth and extent previously permitted for maintenance dredging activities and is not constrained by lake levels. Large-scale dredging operations would involve the use of silt/turbidity curtains and/or dewatering equipment to protect water quality during dredging, unlike the existing small-scale diver assisted suction dredging that immediately returns untreated water to the lake or river. This document does not **analyze dredging other than maintenance dredging** ~~propose or authorize recreational dredging or dredging for purposes other than AIP removal implemented through Tahoe RCD~~. Lake Tahoe sites where dredging has occurred in the past are documented in Table A-2 in Appendix A. These are sites where AIP control could be considered for using dredging methods.

Suction dredging involves loosening materials from the bed, and raising the material while suspended in the water through a pipe system connected to a pump. Material can be loosened through different means. Suction alone can be sufficient in loose soils, but water jets may also be used. Suction dredging systems include suction dredgers, cutter suction dredgers that utilize a cutter head to loosed materials, and trailing suction hopper dredgers, which use a drag head on the suction pipe to dislodge materials. In this method, a boat or pontoon is equipped with an underwater arm to loosen materials within the bed of the waterway through methods (cutting heads, augers, water jets, etc.) and a high-pressure hose system to collect the material, as shown in Figure 2.4.1-4. The arm and hose operate in conjunction, loosening material and collecting it. Dislodged materials are suctioned up and collected through a pipe as a liquid slurry. Solids are separated from the slurry through mechanical solids separators or settling in spoils impoundment basins. While the sediment is removed, the water stays within the area being treated. Suction dredgers operate on a marine vessel in the marina propelled by outboard motors, with an additional diesel engine that powers/pumps the suction dredging equipment. Turbidity curtains are erected around the treatment area to keep turbid waters contained within the area to be treated. The collected material is hauled off-site and disposed of in a landfill ~~unless beach replenishment is included in the proposed control action. Beach replenishment includes separating the collected substrate materials from plants or other objects collected with the dredged material and applying the substrate material to the beach at the control site. This action requires additional permit requirements and studies of the materials to be applied to replenish the beach to ensure the quality of the materials discharged to the beach is non-hazardous.~~

Like mechanical dredging, suction dredging should be conducted by a skilled operator familiar with the equipment to control turbidity. Turbidity can be reduced through control of cutter pressure, equipment rotation per minute speeds, and dredge pull speeds. In addition, the operations and spoils require monitoring to ensure water quality standards are not exceeded. Active dredging activities will be monitored to determine if adaptive management should be applied to adjust the activity and to determine if the implemented best management practices (BMPs) are sufficient or if additional BMPs should be applied.

On average, dredging can be completed within a few days. Clean equipment is brought onsite, turbidity curtains and silt fencing are put into place, and the dredging equipment is put in place and operated. Suction dredgers can process 85 cubic yards per hour (Ecowaterway, 2014). Based on previous maintenance dredging volumes in the affected marinas, site preparation and active dredging could be completed within a day to a week, on average for smaller dredge areas, depending on the size of the affected area and weather conditions at the time the dredging is scheduled to occur.

Constraints to this method include access and land ownership, the presence of underwater structure or utilities, substrate characteristics, the presence of fish spawning habitat, and permitting requirements and limitations associated with Waters of the U.S. and Waters of the State. In general, suction dredging may cause temporary impacts to access and recreation in the treatment area, water turbidity and dissolved oxygen, biomass accumulation, habitat and native species, depending on the dredging location and other site conditions. Since suction dredging would only be applied to small scale infestations, the associated potential impacts would be proportional to the size of the control site and limited to the implementation period.

Figure 2.4.1-4. Illustration of Suction Dredging

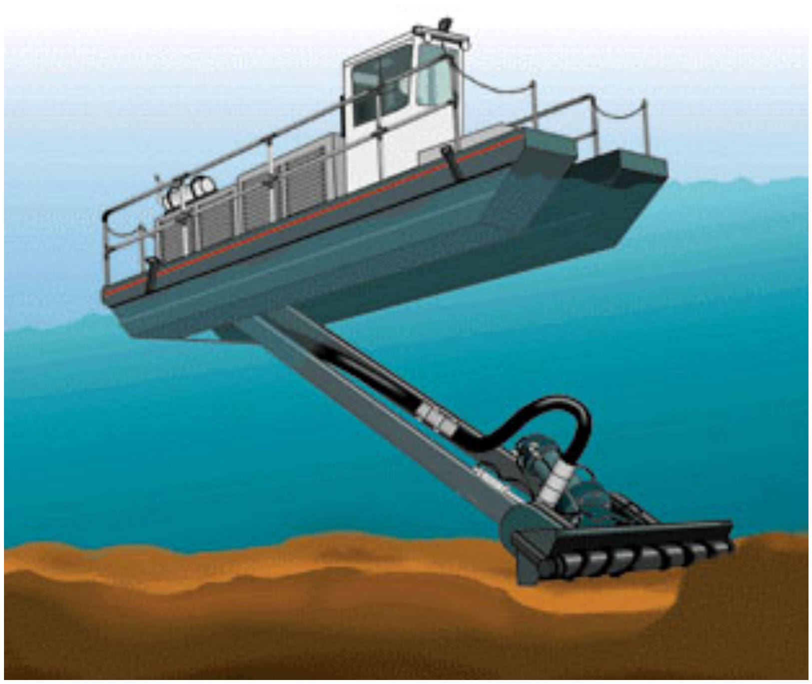


Image from Merrell Brothers Dredging merrellbros.com, site visited October 2019

2.4.1.6 Mechanical Dredging

Although not previously used by Tahoe RCD, marinas in Lake Tahoe have used mechanical dredging methods to remove vegetation and maintain marina access in the past. Mechanical dredging methods (e.g., excavator or clam shell) used to improve boater access at a Crystal Shores Marina showed potential for long-term control of AIP. The operation removed accumulated sediment to improve boater access, but also removed AIP and its associated root mass as part of the dredging. Follow up monitoring demonstrated that the dredged areas continue to be free of new AIP growth. As a result, expanded use of dredging control methods, which are not constrained by lake levels, are proposed as a control method only where maintenance dredging has previously been permitted and completed. Under the project, mechanical dredging equipment may be used to remove the entire plant, root and supporting sediments, and turions, with care taken to avoid leaving plant fragments in the water body. Dredging would be restricted to the depth and extent previously permitted for maintenance dredging activities and is not proposed in areas not previously dredged. Large-scale dredging operations would involve the use of silt/turbidity curtains and/or dewatering equipment to protect water quality during dredging, unlike the existing small-scale diver assisted suction dredging that immediately returns untreated water to the lake or river. This document does not **analyze dredging other than maintenance dredging** ~~propose or authorize recreational dredging or dredging for purposes other than AIP removal implemented through Tahoe RCD~~.

Mechanical dredging involves the use of mechanical equipment, such as a long-arm excavator, clam shell excavator, or crane excavator located on the shore, boat ramp, or on a barge, to scoop material from the bed, raise it to the surface, and dispose of the material in dump trucks or other containers to be hauled offsite and disposed in a landfill outside the Lake Tahoe Basin, as shown in Figure 2.4.1-5. Spoil water is allowed to settle in impoundment basins or settling tank systems located within or upgradient of areas enclosed by a silt curtain. Materials are placed in lined dump trucks for hauling to a landfill outside the Basin. The spoil water is monitored prior to release to measure turbidity and nutrient levels in order to meet discharge standards. To a lesser degree and with permit approval spoil water may be disposed in the sanitary sewer system to reduce nutrient loading into the waterway, although it is not the preferred disposal method due to location and volume constraints. As solids are separated from the spoil water, they are removed to a landfill while the separated water is allowed to percolate into the groundwater. Surface flows are discouraged. Additionally, silt/turbidity curtains are placed in the waterway around the area to be dredged, as shown in Figure 2.4.1-5, to control the dispersion of turbidity and nutrients generated by the dredging activity.

Dredging machinery should be operated by personnel familiar with operational controls for the machinery to minimize turbidity. **As required in Section 2.4.3,** Dredging activities are actively monitored for turbidity, nutrient levels, and compliance with dredging permit requirements to ensure water quality is maintained. Active dredging activities will be monitored to determine if adaptive management should be applied to adjust the activity and to determine if the implemented BMPs are sufficient or if additional BMPs should be applied. Standard operational BMPs include, but are not limited to, cleaning and inspecting machinery prior to and following use, maintaining an emergency spill kit onsite, halting operations during inclement weather/high wave activity, and monitoring and reporting turbidity levels at regular intervals during active dredging.

This method has been used primarily in marina areas in the past to increase or maintain marina depth to maintain navigation and remove buildup of debris, and is able to entirely remove invasive plants and their root systems. In areas requiring extensive removal, materials may be dried onshore prior to removal to a landfill. The collected material is hauled off-site and disposed of in a landfill ~~unless beach replenishment is included in the control action. Beach replenishment includes separating the collected substrate materials from plants or other objects collected with the dredged material and applying the substrate material to the beach at the control site. This action requires additional permit requirements and studies of the materials to be applied to replenish the beach to ensure the quality of the materials discharged to the beach is non-hazardous.~~ Since mechanical dredging is associated with high sediment resuspension characteristics, silt curtains must be used, and this method would be limited in use.

On average, dredging can be completed within a few days. Clean equipment is brought onsite, turbidity curtains and silt fencing are put in place, and the dredging equipment is put in place and operated. On average 58 cubic yards can be mechanically dredged in an hour, depending on the type and size of the excavator (LWG, 2015). Based on previous maintenance dredging volumes in the affected marinas, site preparation and active dredging could be completed within a day to a week, on average, depending on the size of the affected area.

Constraints to this method include access and land ownership, the presence of underwater structure or utilities, substrate characteristics, the presence of fish spawning habitat, and permitting requirements and limitations associated with Waters of the U.S. and Waters of the State. Mechanical dredging can cause temporary impacts to access and recreation in the treatment area, water turbidity and dissolved oxygen, biomass accumulation, habitat and native species.

Figure 2.4.1-5. Photographs of Mechanical Dredging and Silt Curtains

Mechanical dredging equipment at Tahoe Keys
(https://www.tkpoa.com/images/photos/projects/dredging/dredging5348.JPG)

Silt curtain in Lake Tahoe to contain turbidity and nutrients

2.4.2 Indirect Control Methods

Indirect control methods are actions that either remove AIP as a secondary effect of the action or that limit the spread of AIP populations. The laminar flow aeration (LFA) control method is the only indirect control method proposed. LFA would not directly remove individual AIP, but would be used in conjunction with other control methods as a means to limit AIP spread and to change the habitat conditions to discourage AIP from developing or thriving. LFA **systems provide bed sediment and water column aeration and by increasing water body dissolved oxygen concentrations throughout the water column can initiate acceleration of nutrient transformation processes in the water body,** ~~changes the water column chemistry~~ and therefore may indirectly control AIP **through changes in water and sediment quality**.

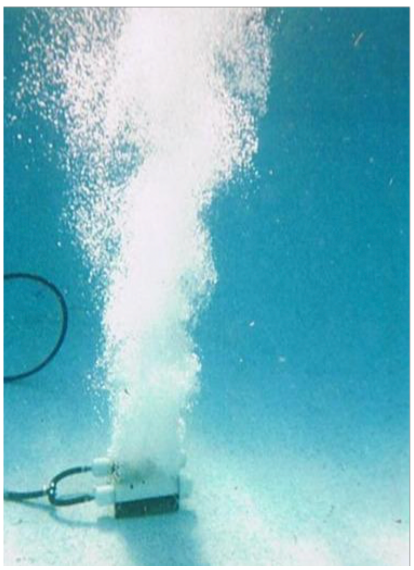
LFA is an indirect aquatic invasive plant control method that does not directly remove individual plants, but limited evidence indicates that the method may prevent their spread and modify conditions to discourage AIP proliferation. Laminar flow inversion and oxygenation, also called "aeration," is a process used to decompose loose organics and dying plants reduce nutrients and to prevent spreading. It creates surface agitation to eliminate areas of stagnant water in which the plants thrive. The aeration increases oxygen to speed the decomposition process. By bringing water and air in close contact, through sheets of small bubbles that rise through the water column, turbulence is created to physically remove dissolved gases and metals by bringing the gases to the surface to escape and oxidizing metals. Aeration may affect volatile organic chemicals, ammonia, chlorine, carbon dioxide, hydrogen sulfide, methane, iron, and manganese. This method is not intended for physical removal of plants, but may be a complimentary method for use along with other control methods.

LFA devices consist of an underwater diffuser that releases compressed air created by a motorized mechanism into the water, as shown in Figure 2.4.2-1. Diffusers can consist of a small square or rectangular diffusing box device where bubbles are produced at specific point or they can consist of bubble tubing where a series of bubbles is produced in a linear pattern. Air diffusers and weighted airline are installed by divers and lie on the bed of the waterway, connected to an **enclosed** air compressor on land **that meets TRPA noise standards**. The released compressed air lifts bottom water to the surface, creating a vertical current that may prevent the lateral spread of invasive plants. The diffusers operate continuously, and limited research suggests this may change the water column and bed environments to create an unattractive environment for AIP. LFA creates water movement to help eliminate stagnant water and may create habitat conditions unfavorable to the invasive plant species. This type of control method is best used in a contained area, which may be associated with stagnant water, such as a marina where the aeration can act as a barrier and also effectively circulate more enclosed or confined waters. **This control method is not proposed for tributaries at this time due to other biological resource factors; however LFA efficacy is currently being tested in open waters of the lake water body that are without extensive natural or manmade enclosures. Ultimately, individual site conditions can vary by size, water column depth, water and sediment quality, degree of AIP infestation and access to power, all of which must be considered during LFA system design and cost development.**

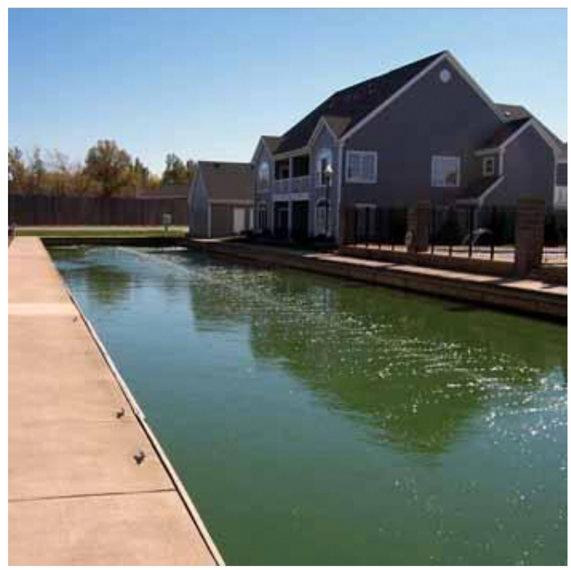
LFA systems are used in enclosed areas, with installation timing varying by the number of diffusers to be installed. The average deployment time to install the materials is one to two days depending on the size of the area and number of diffusers or length of tubing, and existing housing availability for the air compressor. Most compressors can be located within an existing **enclosed** mechanical room and connected to existing electrical service within a marina, however, creation of a new enclosure within the marina **or other non-marina location** may require additional time. Once installed, aerators may operate continuously with no additional disturbance, other than periodic monitoring and maintenance.

Use of LFA techniques can be constrained by access, noise (e.g., requires electrical connection for compressors) and land ownership, water column depth, infestation density, substrate characteristics, and the presence of fish spawning habitat. Beneficial impacts associated with this method include water turbidity and dissolved oxygen, fisheries, habitat quality, biomass, plankton, algae, and chlorophyll, with no impact on access or recreation. This method does not include herbicides, microbes, or chemicals as they have not been approved for use in Lake Tahoe, it can be custom engineered for each control site, it prevents turbidity and restores and maintains aerobic conditions by removing toxic gases and carbon dioxide, oxygenates the entire water column into the sediment layer, reduces or eliminates nutrient loading by preventing the release of nutrients from anoxic sediments, and reestablishes the aerobic environment necessary to accelerate the biological breakdown of plants and organic sediment. LFAs have the potential to redistribute **some** nutrients **through stratification of the water column and reestablishing the aerobic environment required to accelerate biological breakdown of plants and organic sediments (Texas A&M University, https://aquaplant.tamu.edu, Accessed January 21, 2019; TRPA Hearings Officer Memorandum May 17, 2018; Lakeshore Environmental Inc. 2012; Restorative Lake Sciences 2016),** and an increase in macrophytes may occur in adjacent locations; however, project monitoring will occur to ensure no secondary impact occurs, and this method can be quickly suspended if needed.

Figure 2.4.2-1. Photographs of Laminar Flow Equipment and Surface Effect



Diffused aeration device
Image from www.aquaticbiologists.com



Linear aeration with bubble tubing
Image from canadianpond.com

Table 2-1

Control Measures by Control Site Type

Control Measure	Control Site Type			
	Open Water[5]	Tributary[4]	Marina[5]	Marsh[4]
Hand Pulling Removal (no permit required)	X	X	X	X
Permits[2]				
USACE(NWP 27 extends 15 feet from elevation 6229.1)	Not required	Not required	Not required	Not required
TRPA Project Permit[6]	Not required	Not required	Not required	Not required

Table 2-1

Control Measures by Control Site Type

Control Measure	**Control Site Type**			
	Open Water[5]	**Tributary**[4]	**Marina**[5]	**Marsh**[4]
Lahontan	Not required	Not required	Not required	Not required
NDEP	Not required	Not required	Not required	Not required
CDFW LSAA	Not required	Not required	Not required	Not required
NV State Lands	Not required	Not required	Not required	Not required
CSLC Lease	Not required	Not required	Not required	Not required
Method Previously Used:	Used at Whale Beach, Glenbrook Bay, Roundhill Point, Emerald Bay, Tahoe City Dam, Lakeside Beach	Used at Truckee River, Burke Creek, Taylor Creek, Tallac Creek, Eagle Creek, General Creek	Used at Lakeside Marina, Elk Point, Sunnyside, Fleur du Lac	Used in Pope Marsh
Diver-assisted Suction Removal	X	X	X	
Permits[2,3]				
USACE	No permit required[2,3] (Assume regulated by NWP 27 for the hand pulling portion – no additional permit needed for suction) Section 10	No permit required[2,3] Section 10	No permit required[2,3] Section 10	n/a
TRPA Project Permit[6]	Required	Required	Required	n/a
Lahontan	Not required	Not required	Not required	n/a
NDEP	Not required	Not required	Not required	n/a
CDFW LSAA	LSAA for Routine Maintenance	LSAA for Routine Maintenance	LSAA for Routine Maintenance	n/a
NV State Lands (elevation dependent)	Management License	Management License	Management License	n/a
CSLC Lease (elevation dependent)	Lease Agreement	Lease Agreement	Lease Agreement	n/a
Method Previously Used:	Used at Lakeside Beach, Emerald Bay, Tahoe City Dam	Used at Truckee River	Used at Fleur du Lac Marina, Lakeside Marina, Elk Point, Ski Run	n/a
Benthic Barriers	X	X	X[1]	X
Permits[2]				
USACE	Section 404/NWP 27	Section 404/NWP 27	Section 404/NWP 27	Section 404/NWP 27
TRPA Project Permit[6]	Required	Required	Required	Required
Lahontan	Section 401WQC Board Order R6T-	Section 401WQC Board Order R6T-	Section 401WQC Board Order R6T-	Section 401WQC Board Order R6T-

Table 2-1

Control Measures by Control Site Type

Control Measure	Control Site Type			
	Open Water[5]	**Tributary[4]**	**Marina[5]**	**Marsh[4]**
	2020-0032, as amended or superseded	2020-0032, as amended or superseded	2020-0032, as amended or superseded	2020-0032, as amended or superseded
NDEP	BWQP Section 401 WQC and Working in Waterways	BWQP Section 401 WQC and Working in Waterways	BWQP Section 401 WQC and Working in Waterways	BWQP Section 401 WQC and Working in Waterways
CDFW LSAA	LSAA for Routine Maintenance	LSAA for Routine Maintenance	LSAA for Routine Maintenance	LSAA for Routine Maintenance
NV State Lands (elevation dependent)	Management License	Management License	Management License	Management License
CSLC (elevation dependent)	Lease Agreement	Lease Agreement	Lease Agreement	Lease Agreement
Method Previously Used:	Used at Lakeside Beach, Emerald Bay, Tahoe Vista, Tahoe City Dam	Used on Truckee River, Taylor Creek	Used at Lakeside Marina, Ski Run Marina, Emerald Bay, Fleur du Lac, Elk Point	
UV-C Light	X	X	X	X
Permits[2]				
USACE (NWP 27)	Section 10	Not regulated in tributary if light is on boat, raft, or hand held per 2/20/19 meeting	Section 10	Not regulated in marsh if light is on boat, raft, or hand held per 2/20/19 meeting
TRPA Project Permit[6]	Required	Required	Required	Required
Lahontan	Not required	Not required	Not required	Not required
NDEP	Not required	Not required	Not required	Not required
CDFW LSAA	Not required	Not required	Not required	Not required
NV State Lands	Not required	Not required	Not required	Not required
CSLC Lease	Not required	Not required	Not required	Not required
Method Previously Used:	Used at Lakeside Beach		Used at Lakeside Marina	
Suction Dredging (Mechanical-assisted suction removal, with water treatment)	X	X	X	
Permits				

Table 2-1

Control Measures by Control Site Type

Control Measure	Control Site Type			
	Open Water[5]	**Tributary[4]**	**Marina[5]**	**Marsh[4]**
USACE	Section 404/NWP 27	Section 404/ NWP 27	Section 404/ NWP 27	n/a
TRPA Project Permit[6]	TRPA Project Permit	TRPA Project Permit	TRPA Project Permit	n/a
Lahontan	Section 401 WQC TRPA/Lahontan MOU	Section 401 WQC TRPA/Lahontan MOU	Section 401 WQC TRPA/Lahontan MOU	n/a
NDEP	BWQP Section 401 WQC and Working in Waterways	BWQP Section 401 WQC and Working in Waterways	BWQP Section 401 WQC and Working in Waterways	n/a
CDFW LSAA	LSAA for Routine Maintenance	LSAA for Routine Maintenance	LSAA for Routine Maintenance	n/a
NV State Lands (elevation dependent)	Management License	Management License	Management License	n/a
CSLC Lease (elevation dependent)	Lease Agreement	Lease Agreement	Lease Agreement	n/a
Method Previously Used:	Used at Lakeside Beach, Emerald Bay	Never treated in Tahoe Tributary	Used at Fleur du Lac, Ski Run Marina, Elk Point, Tahoe Keys	n/a
Mechanical Dredging (excavator/clamshell on barge or on land)	X		X	
Permits[2]				
USACE	Section 404/NWP 27	Section 404/ NWP 27	Section 404/ NWP 27	n/a
TRPA Project Permit[6]	TRPA Project Permit	TRPA Project Permit	TRPA Project Permit	n/a
Lahontan	Section 401WQC TRPA/Lahontan MOU	Section 401WQC TRPA/Lahontan MOU	Section 401WQC TRPA/Lahontan MOU	n/a
NDEP	BWQP Section 401 WQC and Working in Waterways	BWQP Section 401 WQC and Working in Waterways	BWQP Section 401 WQC and Working in Waterways	n/a
CDFW LSAA	LSAA for Routine Maintenance	LSAA Routine Maintenance	LSAA Routine Maintenance	n/a
NV State Lands (elevation dependent)	Management License	Management License	Management License	n/a
CSLC Lease (elevation dependent)	Lease Agreement	Lease Agreement	Lease Agreement	n/a

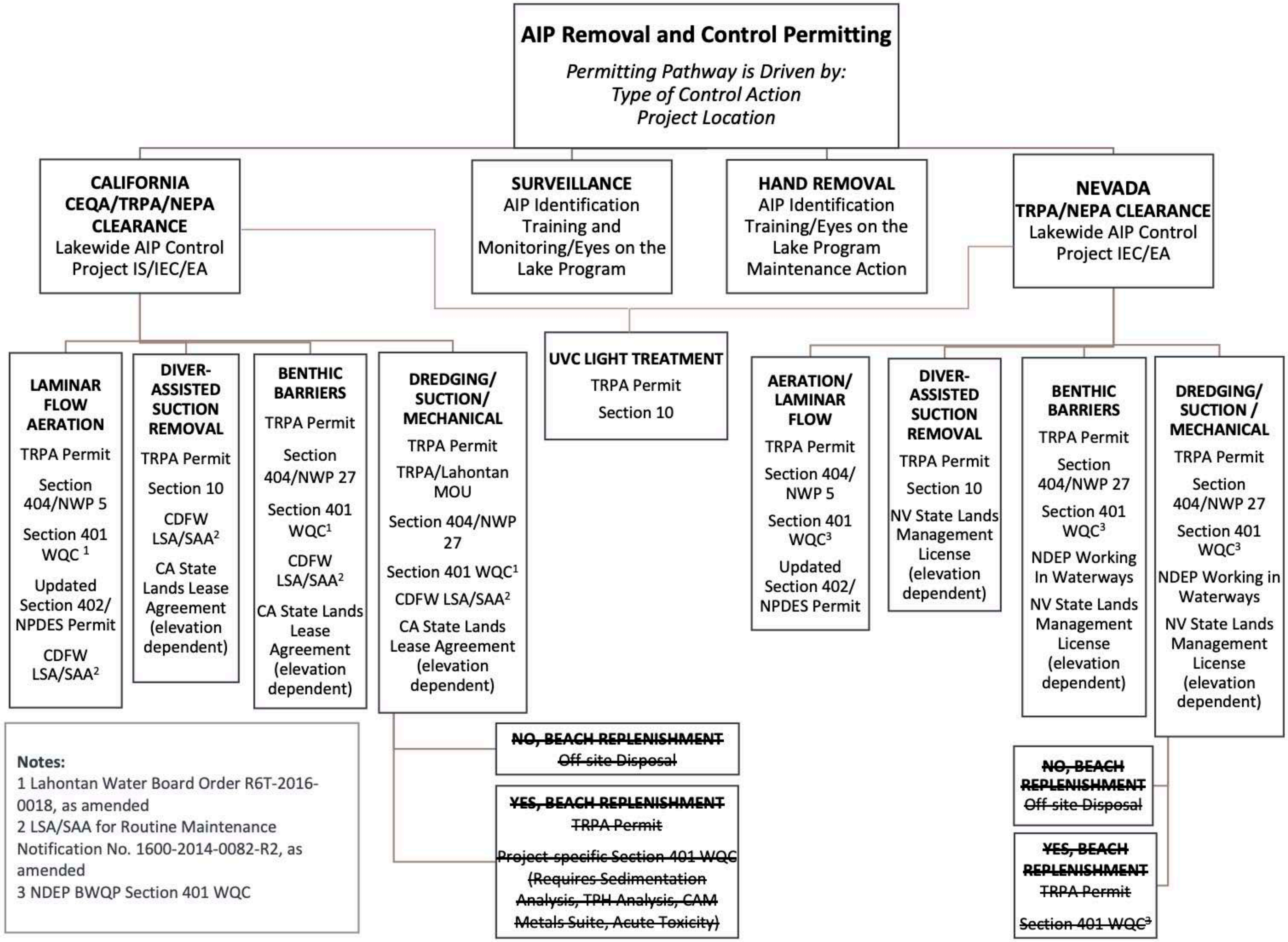
Table 2-1

Control Measures by Control Site Type

Control Measure	Control Site Type			
	Open Water[5]	Tributary[4]	Marina[5]	Marsh[4]
Method Previously Used:	Used at Lakeside Beach and Marina for access	Never used in Tahoe Tributary	Used at Elk Point, Wovoka, Crystal Shores, Logan Shoals, Fleur du Lac, Obexers, Homewood, Tahoe City Marina, Lakeside, Star Harbor, Tahoe Keys, Ski Run, Meeks Bay for access	n/a
Laminar Flow Aeration			X	
Permits[2]				
USACE	~~n/a~~ **Section 404/Nationwide Permit 5**	n/a	Section 404/Nationwide Permit 5	n/a
TRPA Project Permit[6]	~~n/a~~ **TRPA Project Permi**t	n/a	TRPA Project Permit	n/a
Lahontan	~~n/a~~ **Section 401 WQC** **Updated Section 402/NPDES**	n/a	Section 401 WQC Updated Section 402/NPDES	n/a
NDEP	~~n/a~~ **BWQP Section 401 WQC** **Updated Section 402/NPDES**	n/a	BWQP Section 401 WQC Updated Section 402/NPDES	n/a
CDFW LSAA	~~n/a~~ **LSAA Agreement**	n/a	LSAA Agreement	n/a
NDSL water work (elevation dependent)	~~n/a~~ **Not Required**	n/a	Not Required	n/a
CSLC Lease (elevation dependent)	n/a	n/a	n/a	n/a
Method Previously Used:	~~n/a~~ **Used at Fleur du Lac**	n/a	Used at Ski Run, Tahoe Keys	n/a

Notes:
1 – Benthic barriers are not well suited for marinas with deep deposits of fine sediment/silt (e.g., Ski Run and Lakeside).
2 – Per Jennifer Thomason email 2/22/19 Section 7 coordination needed.
3 – Provide video verification the first year used
4 – Annual (individual) permit for tributaries and marshes. Permit applications need to be submitted beginning of March to start work in May of each year.
5 – Activity in marina and lakewide below high water mark to a depth of 15 feet can use current nationwide permits (good until 2022). Lakewide and marina can also be issued an individual permit if needed.
6 – TRPA Permit EIPC2009-0002, as amended or superseded.
n/a – Not applicable as the method is not proposed for this control site type.

Figure 2-2. AIP Removal and Control Permitting Pathway



2.4.3 Monitoring, Surveillance, and Evaluation

Tahoe RCD, in coordination with other program partners, will facilitate survey and monitoring activities to identify AIP control sites (e.g., tributaries and marshes in addition to Lake Tahoe waters) and the identification of the appropriate AIP control method to be used for the removal of AIP in Lake Tahoe and its tributaries, including some stretches of the upper and lower Truckee River adjacent to Lake Tahoe. The Action Agenda recommends monitoring strategies such as a broad spectrum near-shore-wide census every two years for six years, followed by once every five years, and in situ diver survey transects and drone surveys at 25 priority locations in intervening years.

Various organizations and agencies are involved in the monitoring and surveillance aspects of the project. TRPA coordinates annual lake-wide monitoring following the Lake Tahoe Aquatic Plant Monitoring Program: Aquatic Plant Monitoring and Evaluation Plan. The League to Save Lake Tahoe oversees the "Eyes on the Lake" citizen science program in which staff train community members how to identify and report the location and presence of AIP in Lake Tahoe's waters. The USFWS and CDPR also conduct AIP monitoring within their jurisdictions. Monitoring occurs to conduct early detection of AIP to prevent establishment, evaluate effectiveness of control methods following implementation, determine if the control action approach needs to be modified, determine impacts of methods on non-target species, and monitor AIP population trends.

Monitoring and surveillance of waterways within the project area, including areas that have been previously or are actively affected by control methods, is a key component for all of the control methods because early detection is critical to effectively controlling infestation. Monitoring of control methods left in place for long periods, such as benthic barriers, is a component of those control methods; however, monitoring of areas that were treated in the past is a key component regardless of which control method is used. Areas that were previously treated would be periodically monitored to assess whether the control method was successful and for signs of re-infestation due to unsuccessful implementation, new introduction by boats or other movement, or due to other conditions within the lake, marsh, or tributary. Monitoring during and after treatment is also necessary to assess environmental impact, such as habitat disruption and elevated turbidity, which may affect how or whether certain types of control methods are used in the future.

As described above, annual monitoring of plant populations is imperative in effective management. While post-treatment observations may indicate that plants have been removed, recolonization from roots, fragments, and buried plants is likely in infestations. Experience has shown that annual treatment cycles in excess of three years are necessary for effective management of aquatic invasive plants. This suggests that effective control requires that the same area is treated each year for a minimum of three years. Following comprehensive treatment, however, monitoring has reported that re-treatment in subsequent years requires less time and resources due to reduced plant density. To be useful in effectiveness evaluations, pre-treatment infestation evaluations must record spatial information, such as location and extent. Pre- and post-treatment evaluations will be conducted for plant control actions and year-over-year comparisons will assist in subsequent control site prioritization.

2.4.3.1 Pre-Treatment Monitoring

Pre-treatment monitoring includes general monitoring of the potential submersed aquatic plant habitat area as mapped on Figures 2-1, 2-1a through 2-1e, detecting infestations, scheduling/prioritizing areas to be treated and identifying which methodology(ies) to implement within the area, and finally monitoring and characterizing the area to be treated prior to control implementation to ensure the appropriate methodologies are used and installed/established to protect resources in the area. Resource protection includes knowledge of the substrate, existing subsurface utilities or hazards, native plant and animal species present in the area, cultural resources present in the area, public use and access of the area, and the existing quality and characteristics of the water in which the control action will occur.

2.4.3.2 Water Quality Monitoring

A Water Quality Monitoring Plan will be prepared and presented to the TRPA and Lahontan for approval prior to conducting Project activities. Turbidity monitoring is an integral part of aquatic plant control in Lake Tahoe because turbidity levels that violate water quality standards must be mitigated, **and it takes a substantial amount of sediment disturbance to affect other water quality parameters (e.g., conductivity and total dissolved solids)**. **As such, control measure applications may also include requirements for pre- and post-treatment field meter water quality sampling (e.g., water temperature, dissolved oxygen concentrations, pH) to ensure compliance with numeric water quality objectives. If required because of unique situations, the frequency of field meter sampling would be determined by the complexity of the proposed control treatment method**. The Water Quality Monitoring Plan template is already established. The template will be revised to reflect site-specific requirements of individual control sites, as appropriate to address permit conditions. Most of the turbidity observed during barrier installation or hand removal results from diver or worker movements that disturb bottom sediments. The disturbance is easily noticed on continuous turbidity readings and returns to background levels quickly once the barriers are placed or the divers retreat, as shown by monitoring results of pilot AIP removal and control projects.

Turbidity levels have been monitored throughout previous control work efforts in Lake Tahoe. Previous work to remove Asian clams in Emerald Bay (2005-6, 2009-2011) using a barrier system similar to that proposed for this project recorded higher background and project turbidity levels (often above 0.50 NTU) compared to Lake Tahoe proper (about 0.25-0.35 NTU). Turbidity in marina environments is between 1.5 and 2.5 NTU and can rise rapidly depending on substrate composition. If turbidity levels exceed permit compliance (> 3 NTU), Project activity shall stop until compliant turbidity levels return. While the turbidity levels during bottom barrier installation and removal are much less than during diver-assisted hand removal, results from previous diver-assisted hand removal efforts have shown a discrete, short-term disturbance with turbidity levels dropping to background within 10-15 minutes.

2.4.3.3 Fish Habitat Characterization

Fish habitat characterization will be completed when required in permit conditions for individual control sites. Method will follow those outlined in the study by Beauchamp, D. A et al. Titled “Summer habitat use by littoral-zone fishers in Lake Tahoe and effects of shoreline structures” (1994).

2.4.3.4 Hazards Analysis and Critical Control Point (HACCP) Plan

To prevent impacts to Lake Tahoe from inadvertent movement or introduction of non-target species, regulatory agencies in the Lake Tahoe basin are now requiring preparation and adherence to a HACCP plan. HACCP planning is an international standard for reducing or eliminating the spread of unwanted species during specific processes or practices, such as delivery, removal, and installation of benthic barriers. The Water Quality Control Plan for the Lahontan Region (Lahontan 1994 Chapter 5: Water Quality Standards and Control Measures for the Lake Tahoe Basin) has designated beneficial uses for the surface waters of the Lake Tahoe Hydrologic Unit, such as Cold Freshwater Habitat. HACCP planning is a permit requirement of this Project. Preparation of a HACCP Plan is an element of risk management that is built into the Project to protect beneficial uses. Implementation of the HACCP plan eliminates the Project’s potential direct and indirect impacts to biological resources caused by the degradation of cold freshwater habitat.

2.4.3.5 Cultural Resource Surveys

For sites located within culturally sensitive areas as mapped (Figure 3) in the Cultural Resources Analysis for the Tahoe RCD Lake-Wide Control of Aquatic Invasive Plants Project (Cardno December 2019), a qualified archaeologist will survey the control site and the appropriate cultural review documentation will be completed. If evidence of potentially significant historical/archaeological resources is found (shell, burned animal bone or rock, concentration of bottle glass or ceramics, etc.), the archaeologist will be contacted, and work will be suspended until identification and proper control methods are determined and implemented.

2.4.3.6 Tahoe Yellow Cress Surveys/Resource Protection Measures

Tahoe yellow cress (*Rorippa subumbellata*) is a small perennial plant in the *Brassicaceae* (Mustard) family. Tahoe yellow cress is endemic to the sandy shores of Lake Tahoe. The species is listed as Endangered in California, Critically Endangered in Nevada, and has been a candidate species for listing under the federal Endangered Species Act since 1999. In response to near extinction of the species in the late 1990s, a Conservation Strategy for Tahoe Yellow Cress was completed in 2002. Thirteen stakeholders, including TRPA, signed a Memorandum of Understanding agreeing to implement the strategy. A Tahoe Yellow Cress Stewardship Program has been developed through the Nevada Tahoe Conservation District, Nevada Division of Forestry and the NRCS to conserve this plant. Monitoring and project-related surveys are ongoing as per the Conservation Strategy for Tahoe Yellow Cress.

The Project will use developed launch sites to access Lake Tahoe and improved or developed access points to Lake Tahoe and the Truckee River for project access and staging areas whenever possible. When access and staging areas must be located on the lakeshore, a qualified environmental scientist will conduct TYC surveys during Project coordination. Should TYC be present, access and staging areas will be located to avoid potential disturbance to occupied TYC habitat, and appropriate enclosure and signage will be established. Due to the nature of aquatic invasive plant removal techniques, access and staging areas will avoid sensitive habitat areas like sandy shorelines.

2.3.3.7 Subsurface Utility Location

Subsurface utilities will be affirmatively documented by 1) contacting public and private utilities that provide service in the vicinity of the control site; 2) contacting the Underground Service Alert; or 3) other equivalent contact. Documentation will be provided to Lahontan when applying for coverage under the CWA Section 401 Certification. If subsurface utilities are located in the control site (e.g., boundaries where there will be excavation for sample collection or other purposes and/or driving of rebar stakes or other materials to secure benthic barriers), a Utility Avoidance Plan will be developed and followed.

2.4.3.8 Post-Treatment Monitoring and Control Maintenance

A key component to controlling aquatic invasive species infestations is post-treatment monitoring. Post-treatment monitoring tracks whether treated areas have fully removed the infestation, and what type of plants or plant fragments remain. If treated areas are monitored and the monitoring identifies new plant growth, those areas can be re-treated, or maintenance measures applied to eradicate the infestation or prevent extensive re-infestation of species at a higher cost of control. If the affected areas can be maintained with lower levels of control effort, the cost of treatment and the potential for infestations to spread to other areas are minimized.

Post-treatment monitoring is conducted immediately following control implementation and annually following control implementation. This monitoring will include identification of the area being monitored and the control method(s) applied, the period of control implementation, and the post treatment success rate. If aquatic invasive species are identified during post-treatment monitoring, the species and number of plants will be noted, including approximate plant size/maturity, and the location of the plants within the treatment area. Monitors will also provide a recommendation as to maintenance methodology to keep re-infestation from occurring.

Post-treatment monitoring will not only be used to monitor treated areas to ensure they are maintained and avoid expensive and intensive control actions, this monitoring will also be used to identify the success rate of the control methods used, how the control method was or was not successful, potential reasons why new plants have re-established in the treatment area, and potential changes or improvements to the methods previously used.

2.4.4 Resource Protection Measures

For the purposes of this joint-agency document, mitigation measures in Section 3, which would be incorporated into the Project, serve as Resource Protection Measures (RPMs). The attached mitigation monitoring report in Section 4 consolidates these mitigation measures/RPMs that would be implemented as necessary as part of the project action. Project RPMs currently implemented by the AIP Control Program include the monitoring and reporting listed in Section 2.4.3: pre-treatment monitoring, water quality monitoring, fish habitat characterization, hazards analysis and critical control point plan, cultural resource surveys, subsurface utility location, and post-treatment monitoring. Other measures include night operations, recreation area protocol and general wildlife protection measures as follows.

2.4.4.1 Night Operations

Night-time operations are possible to minimize conflicts with recreational use and to maximize safe working conditions for the divers and crews. Should night operations be employed, divers and deck crews would use lights to facilitate AIP control operations. This would include lighted dive gear and lighted work platform deck(s).

2.4.4.2 Recreation Area Protocol

Control project staff will be made aware of visitor use in the potential staging areas and Ranger staff, Visitor Services, and Maintenance personnel will be contacted beforehand to be sure that Project activities will not interfere with normal recreational operations. If there is a conflict, control project implementation staff will be notified that the plan for access, staging, and disposal must be amended.

2.4.4.3 General Wildlife Protection Measures

1. If previously unidentified sensitive species are discovered before or during implementation activities, the affected specialist(s) shall develop appropriate measures (e.g., flag and avoid, limited operating period, buffer zones) to protect such resources: Federal ESA and State (CESA) Threatened, Endangered, Candidate and Proposed species; FSS species; TRPA Special Interest and sensitive species (e.g., peat-dominated soils); migratory bird nests; and California Department of Fish and Wildlife/California Native Plant Society (CDFW/CNPS) listed species.
2. Prior to construction, contractors, and subcontractor project personnel shall receive training from qualified resource specialists (Tahoe RCD to determine personnel) regarding the appropriate work practices necessary to effectively implement the RPMs and to comply with the applicable environmental laws and regulations, including appropriate wildlife avoidance and resource protection measures, impact minimization procedures, the importance of sensitive resources and the purpose and methods for protecting such resources.

3. Trash and food shall be removed from the site at the end of each workday.
4. No harm, harassment, or collection of plant and wildlife species shall be allowed. Feeding of wildlife shall be prohibited.
5. Avoid removing or altering bank stabilizing vegetation, live or dead trees within 5 feet of the bank edge of perennial or intermittent streams and lakes or ponds, unless the action is needed to meet project objectives.
6. If water drafting or pumping diversions are needed for project implementation activities, water levels at drafting locations would be maintained to support the needs of aquatic dependent species and associated habitat. Such activities would use guidance described in BMP 2.5 (Regional BMP guidance, USDA 2011) to protect water quality and aquatic species.
7. Any contractor would be solely responsible for ensuring that all equipment, boats, and other aquatic equipment meet the requirements of the Lake Tahoe Aquatic Invasive Species Watercraft Inspection Program. Further information is found at www.tahoeboatinspection.com. Equipment would be inspected for aquatic invasive species and a decontamination performed if deemed necessary by the watercraft inspector. In addition, routine equipment maintenance would occur before use.
8. Field gear (waders, non-motorized crafts, bottom barriers etc.) would be cleaned, decontaminated, and/or fully dried prior to entering or moving between aquatic habitats. Decontamination will follow Chytrid decontamination protocol in Appendix D of the Wildlife BE for this project.
9. On National Forest System lands, benthic barriers would be cleaned at an established and TRPA-approved decontamination facility.
10. All invasive plant and animal species collected as part of this project would be disposed of offsite
11. Any boats used in aquatic invasive species removal activities would have an Emergency Spill Response Plan and clean up kit.
12. Personnel and divers conducting AIP control actions will be trained in the identification and potential presence of western pearlshell mussels (*Margaritifera falcata*), which may occur in project area, specifically in the Truckee River, Upper Truckee River and Trout Creek Watersheds. Surveys should be conducted prior to implementation of AIP removal techniques that could harm or kill the mussels (specifically bottom barriers). If mussels are detected prior or during implementation, personnel and/or divers should coordinate with agency lead biologist to determine the best suited treatment method to avoid harm or determine if mussels should be relocated. Relocation will entail coordination with state Fish and Wildlife agencies and will take into consideration the mussel population within and outside the project area. Prevention/minimization of project impacts shall be addressed before resuming the treatment.

2.4.4.4 Plant Material Disposal

The plant materials collected during AIP removal are transferred into on-shore garbage cans or dumpsters for removal and disposal. The material is gathered in the access and staging area and then transported to South Tahoe Refuse in South Lake Tahoe on the South Shore, and Tahoe Truckee Sierra Disposal in Tahoe City on the North Shore. When the infestation produces a substantial quantity of AIP debris, boats and garbage dumpsters will be used. If the infestation is small, it is likely multiple divers will hand remove the plants from locations along the beach and dispose of the biomass in vehicles parked nearby. Some bagged plant material may be left on the beach to dry for short periods before removal to reduce the weight of the material for removal. If the plants are collected by boat, the driver of the boat will either carry the weed biomass to the closest marina or the diver will drive the boat to a pier or beach and the biomass will be transferred from the diver to buckets or wheelbarrows. The biomass will then be loaded in a truck and taken to a dumpster. When possible, a dumpster may be placed at a staging area for direct disposal.

2.4.5 Proposed Implementation Schedule

The typical control schedule begins in May, when divers conduct reconnaissance plant surveys at project sites. Between May and July, surveys are conducted, plant barriers are installed, and removal methods are implemented. Between October and November, barriers are removed unless over-wintered, and non-barrier control methods continue.

This Project proposes to treat areas of aquatic plant infestation deemed to be the highest priority by the Lake-wide Aquatic Plant Management Plan and within resource availability for any given year. The total area of plant removal will vary and be dependent on the control method(s) employed, plant density, weather, and resource availability. This Project is anticipated to begin following agency approval and issuance of lake-wide permits and continue until new methods are identified and require new study/permitting.

2.4.5.1 Annual Calendar

Depending on the sites selected for treatment, previous control methods performed, and resources available, the specific activities during any given year will vary. However, a plant control implementation year will roughly follow the timeline shown in Table 2-2. Implementation of control methods other than monitoring would occur between May and November annually. Monitoring begins in April through June to identify infestations while the growing season is at its onset. Once infestations are identified, rapid response is employed to begin treating areas.

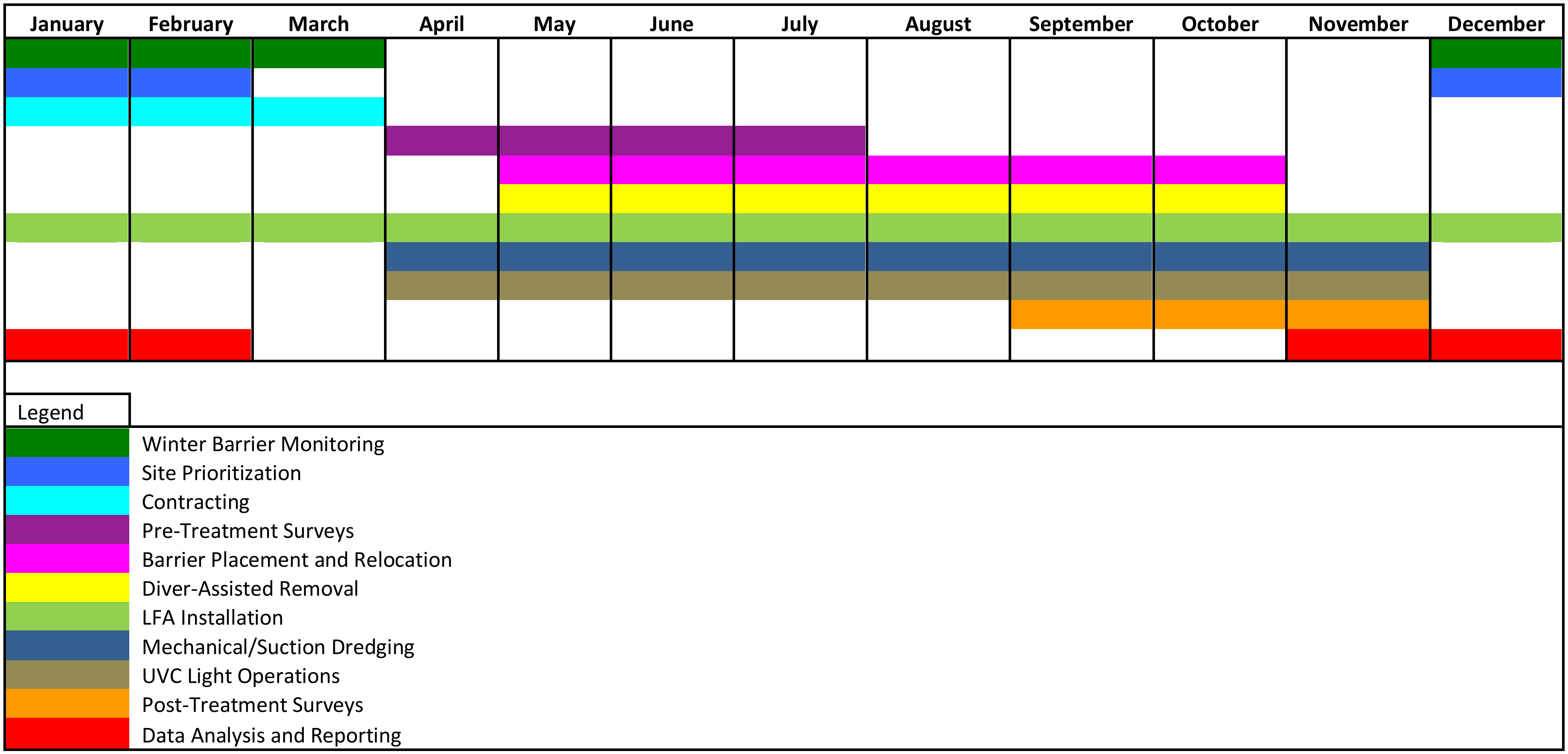
The timing provided in Table 2-2 is approximate. The efficiency and timing of aquatic plant removal is affected by many factors, including control method, weather and water conditions, substrate composition, and equipment malfunctions (e.g. suction hose clogging).

2.4.5.2 Project Timeline

This lake-wide Project will continue the ongoing aquatic invasive plant control efforts that are currently underway and initiate control efforts at newly selected sites. Maintenance of existing control sites is expected to occur over the next five to ten years in support of the Action Agenda, or as extended by the partner agencies. Newly selected control sites will likely require two to three years of comprehensive control activity, followed by annual surveillance monitoring. The spatial extent and duration of surveillance monitoring at an infestation site will vary depending on the site size and the annual recolonization of plants. Experience has shown that repeated and rigorous follow-up is required at control sites to ensure minimal recolonization. For the duration of this Project, each control site may be in a phase of control implementation different from other sites.

Table 2-2

Typical Calendar Year for Annual Aquatic Invasive Plant Control Efforts



Source: Tahoe RCD and TRPA Staff 2013, HBA 2019

SECTION 3 ENVIRONMENTAL ANALYSIS

For CEQA and TRPA purposes, the evaluation of environmental impacts is based upon the completion of the checklist portion of the Initial Study and Initial Environmental Checklist, and consists of the analysis of each impact issue area required under CEQA and TRPA. The analysis of each checklist item identifies significance criteria or thresholds used to evaluate each impact question, and any mitigation measure(s) identified to reduce the impact to a less-than-significant level. For the purposes of this joint-agency document, mitigation measures identified herein, and which would be adopted as part of a Project approval, are serving as resource protection measures (RPMs) for NEPA purposes.

This checklist identifies physical, biological, social and economic factors that might be affected by the Proposed Project (Project). In some cases, background studies performed in connection with the Project indicate no impacts. A “No Impact” answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA impacts and not NEPA effects. The questions in this analysis section are intended to encourage the thoughtful assessment of impacts.

To address potential NEPA requirements, this section describes the affected environment and environmental consequences that could result from implementation of the Proposed Action (Project) and No Action Alternative described in Section 2. Aspects of the affected environment described in this section focus on relevant resources as determined by the context, duration and intensity of potential effects and by the issues identified during internal and external scoping. Consistency with the LTBMU Forest Plan is also analyzed. Only those aspects of the affected environment that are potentially affected by the Project and No Action Alternative are described in detail.

The following environmental analysis has been prepared using the CEQA Guidelines Appendix G: Environmental Checklist Form to complete an Initial Study (IS). This checklist also includes analysis of environmental impacts required in the TRPA Initial Environmental Checklist (IEC) found at: http://www.trpa.org/wp-content/uploads/Inital_Environmental_Checklist.pdf. Additional NEPA analysis per the LTBMU is included as appropriate.

CEQA

CEQA requires a brief explanation for answers to the Appendix G: Environmental Checklist except "No Impact" responses that are adequately supported by noted information sources (see Table 3-1). Answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

Table 3-1

CEQA Defined Levels of Impact Significance

Impact Severity	Definition
No Impact	A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
Less than Significant Impact	"Less than Significant Impact" applies where the Project's impact creates no significant impacts based on the criterion or criteria that sets the level of impact to a resource and require no mitigation to avoid or reduce impacts.
Less than Significant Impact after Mitigation	"Less than Significant Impact after Mitigation" applies where the incorporation of mitigation measures has reduced an effect from potentially "Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level.
Significant Impact	"Significant Impact" is appropriate if there is substantial evidence that an effect is potentially significant, as based on the criterion or criteria that sets the level of impact to a resource. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
Source: CEQA Appendix G Environmental Checklist Form 2018	

TRPA

Article VI of the TRPA Rules of Procedures presents the rules governing the preparation and processing of environmental documents pursuant to Article VII of the Compact and Chapter 3 of the Revised TRPA Code of Ordinances.

TRPA uses an IEC, in conjunction with other available information, to determine whether an EIS will be prepared for a project or other matter. This could include preparation of an Environmental Assessment, in accordance with Section 3.4 of the TRPA revised Code, when TRPA determines that an IEC will not provide sufficient information to make the necessary findings for a project.

The IEC includes a series of questions categorized by and pertaining to resources regulated by TRPA. Each checklist item requires a checked response of "Yes," "No," "No, with Mitigation," or "Data Insufficient." A checked response of "Data Insufficient" or a determination that a project may have a significant effect on the environment (Section 3.3.2 of the TRPA Code) indicates that additional environmental review in the form of an Environmental Impact Statement (EIS) is required. The IEC form indicates that all "Yes" and "No, with Mitigation" responses require written explanations. This IEC provides supporting narrative for all responses. Where a checked response may not be intuitive or easily understood by the reader, that response has been marked with an asterisk (*) and a brief clarifying statement supporting the rationale for the checked response is included. Based on an initial review of the Project, TRPA staff determined that an IEC would provide sufficient information regarding the Project to make one of the findings below. As set forth in Code Subsection 3.3.1, based on the information submitted in the IEC, and other information known to TRPA, TRPA shall make one of the following findings and take the identified action:

1. The proposed project could not have a significant effect on the environment and a finding of no significant effect shall be prepared in accordance with TRPA's Rules of Procedure.

2. The proposed project could have a significant effect on the environment, but due to the listed mitigation measures which have been added to the project, could have no significant effect on the environment and a mitigated finding of no significant effect shall be prepared in accordance with TRPA's Rules of Procedure.

3. The proposed project may have a significant effect on the environment and an environmental impact statement shall be prepared in accordance with this Chapter and TRPA's Rules of Procedure.

When completed, TRPA reviews the IEC to determine the adequacy and objectivity of the responses. When appropriate, TRPA consults informally with federal, state, or local agencies with jurisdiction over the project or with special expertise on applicable environmental impacts.

NEPA

The EA is prepared in compliance with CEQ guidelines for NEPA to disclose the significance of project effects. This EA does not use a checklist for NEPA. The Proposed Action is evaluated on impacts from the proposed action and for consistency with the 2016 Forest Plan standards and guidelines for each environmental topic area. Per Section 40 CFR 1508.27, beneficial and adverse impacts of implementing the Proposed Action are evaluated for context and impact intensity under the following factors:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

Under CEQA, if environmental factors are checked below, there would be at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages. As discussed in the checklist analysis, there are no potentially significant impacts associated with the project that cannot be sufficiently mitigated.

☐ Aesthetics	☐ Agriculture/Forest Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology Resources	☐ Greenhouse Gas Emissions	☐ Hazards/Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use/Planning	☐ Mineral Resources
☐ Noise	☐ Population/Housing	☐ Public Services
☐ Recreation	☐ Transportation/Traffic	☐ Tribal Cultural Resources
☐ Utilities/Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance
	☐ None	☒ None with Mitigation Incorporated

CEQA ENVIROMENTAL DETERMINATION

On the basis of this Initial Study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required

Nicole Cartwright Tahoe RCD	Date

TRPA ENVIRONMENTAL DETERMINATION (TO BE COMPLETED BY TRPA)

On the basis of this TRPA Initial Environmental Checklist:

a. The proposed project could not have a significant effect on the environment and a finding of no significant effect shall be prepared in accordance with TRPA's Rules of Procedures	☐ Yes	☒ No
b. The proposed project could have a significant effect on the environment, but due to the listed mitigation measures which have been added to the project, could have no significant effect on the environment and a mitigated finding of no significant effect shall be prepared in accordance with TRPA's Rules of Procedures.	☒ Yes	☐ No
c. The proposed project may have a significant effect on the environment and an environmental impact statement shall be prepared in accordance with this chapter and TRPA's Rules of Procedures.	☐ Yes	☒ No

Signature of Evaluator

Date

Title of Evaluator

3.1 CUMULATIVE PROJECTS CONSIDERED

"Cumulative Impacts" is defined by CEQA Guideline section 15355 as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

> (a) The individual effects may be changes resulting from a single project or a number of separate projects.
>
> (b) The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."

See also CEQA Guideline section 15065(a)(3). "A cumulative impact results from the combination of an adverse impact of the project together with related impacts caused by other projects. The project must contribute to the adverse impact; otherwise the impact cannot be characterized as a cumulative impact of that project." (Kostka & Zischke, Practice Under the Cal. Environmental Quality Act (Cont.Ed.Bar 2009) § 13.38, p. 647; Sierra Club v. West Side Irrigation District (2005) 128 CAL.APP.4TH 690) in others words, if a project does not make some contribution to a cumulative environmental effect, the cumulative effect cannot be characterized as a cumulative impact of that project.

Under NEPA, a cumulative impact is the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR Section 1508.7). Cumulative effects include the combined effects of many projects as well as the repeated or additive effects of a single project.

In this document, cumulative analysis under NEPA is discussed on a resource-by-resource basis, while for CEQA it is primarily discussed under the "Mandatory Findings of Significance" section (3.22)

3.1.1 Past Projects

The past AIP projects or types of projects located in the shorezone and considered towards cumulative effects are described in Appendix A. Other past projects in the area include, but are not limited to, marina maintenance dredging, pier removal or relocation, the Emerald Bay Asian Clam Control Pilot Project (2012-2014), shorezone structure permitting and construction (piers, buoys, marina boat slips, boat ramps, and related channel dredging) and other Aquatic Invasive Species control projects.

3.1.2 Present and Reasonably Foreseeable Projects

The following list includes current and reasonably foreseeable projects within Lake Tahoe, Upper Truckee River, and the Truckee River corridor considered towards cumulative effects:

- Lake Tahoe Passenger Ferry Service;
- Highway 89 Bypass Project at Tahoe City;
- Truckee River Rafting Permit Reauthorization;
- Maintenance dredging for existing marina channels and boat ramps;
- Pier extensions or relocations;
- Lake Tahoe West Restoration Project;
- Upper Truckee Marsh Restoration Project;

- **Aquatic invasive plant control in the Tahoe Keys Marina and Lagoons;**
- Ongoing aquatic invasive plant control (Lake Tahoe Aquatic Invasive Plant Control Implementation Project) and Target invasive fish control program at marinas, tributaries, and the Upper Truckee Marsh; and
- Buoy relocations.

3.2 AESTHETICS, SCENIC RESOURCES, COMMUNITY DESIGN, AND LIGHT AND GLARE

3.2.1 Setting

The topography, flora, water features, and climate combine to create the aesthetic character of the Project Area. Lake Tahoe is a large, high elevation (approximately 6223 feet) lake in the Sierra Nevada Mountains. The Lake Tahoe Basin is renowned for its natural beauty and Lake Tahoe is recognized as an Outstanding National Resource Water by the USEPA's Water Quality Standards Program and the Clean Water Act. Rugged peaks, forested slopes, and the clear, blue waters of the lake characterize the scenery. The lake sits in a basin encompassed by the Crystal Range to the west and the Carson Range to the east. The border between California and Nevada divides the lake. Lake Tahoe Basin is approximately 20 miles southwest of Reno, Nevada and approximately 80 miles northeast of Sacramento, California.

The scenic vistas and visual resources of the Lake Tahoe Basin are widely valued by residents and visitors to the area. As summarized in the TRPA *Regional Plan:*

> Scenic quality is perhaps the most often identified natural resource of the Lake Tahoe Basin. The Basin affords views of a magnificent lake setting within a forested mountainous environment. The unique combination of visual elements provides for exceptionally high aesthetic values. The maintenance of the Basin's scenic quality largely depends on careful regulation of the type, location, and intensity of land uses.

CEQA guidelines identify the Lake Tahoe Basin as an area of critical environmental sensitivity for its scenic as well as its ecological and recreational value. Federal policy, under the U.S. Department of Transportation Act Section 4(f), provides that "special effort should be made to preserve the natural beauty of the countryside and public park and recreational lands, wildlife, and waterfowl refuges, and historic sites." The TRPA Compact states that the "Maintenance of the social and economic health of the region depends on maintaining the significant scenic values provided by the Lake Tahoe Basin" (TRPA Compact 1980).

The Lake Tahoe Region is a unique alpine destination offering immense vistas and vast amounts of natural beauty and scenery. The scenic beauty of the region is recognized as a national treasure. Because of this natural beauty, alpine setting, and large lake, the region is a popular recreation and vacation destination offering boating, skiing, hiking, and tourist accommodations as well as residential and commercial land uses that create a mixture of aesthetic characteristics throughout the Lake Tahoe Region (TRPA 2007).

The region offers a variety of natural settings and vistas. Some areas are characterized by meadows, while others include rocky outcrops and forest vegetation. As a basin, mountain peaks and ridgelines are visible around the lake. Most mountainsides lack structural development with the exception of ski facilities where straight, vertical swaths of cleared forest can be seen from roadways, communities, and the lake.

Most development along with major roads are concentrated on more gentle topographic settings near lake level. Development surrounds much of Lake Tahoe, with the north and south shores generally more developed than the west or east shores. Amongst the array of trees, is a mixture of parks, beaches, residences, and commercial development often located along the shoreline of the lake.

TRPA scenic standards and state scenic highway programs regulate visual change in the area.

TRPA standards require maintenance of threshold rating values for roadway and shoreline travel routes, individually mapped scenic resources, recreation area scenic resources, and compatibility with the natural environment. For travel routes or views from inventoried scenic resources that are not in attainment, TRPA standards require mitigation actions to contribute to reaching attainment. The TRPA travel route ratings track long-term, cumulative changes to views from state and federal highways in urban, transition, and natural visual environments in the region. The ratings also track changes to shoreline views from the surface of Lake Tahoe. Roadways are divided into 53 travel segments (called “travel units”), each representing a continuous, two-directional viewshed of similar visual character. Lake Tahoe’s shoreline is divided into 33 shoreline units.

The California Legislature initiated the California Scenic Highway Program in 1963, with the goal of preserving and protecting the state’s scenic highway corridors from changes that would reduce their aesthetic value. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. The State Scenic Highway System consists of eligible and officially designated routes. A highway may be identified as eligible for listing as a state scenic highway if it offers travelers scenic views of the natural landscape, largely undisrupted by development. Eligible routes advance to officially designated status when the local jurisdiction adopts ordinances to establish a scenic corridor protection program and receives approval from the California Department of Transportation. In 1983, the Nevada State Legislature established the Scenic Byways program in Nevada. The Nevada Department of Transportation is the lead agency for the program and the Director has signature authority to establish a road as a Scenic Byway.

Designated Scenic highways in the Lake Tahoe Basin include federal U.S. Highway 50 (US 50), California State Routes 89 (SR 89), 28 (SR 28) and 267 (SR 267), and Nevada SR 28.

3.2.2 Environmental Impacts of the No Action Alternative

The No Action Alternative implements no AIP control activities and therefore results in no direct effects to scenic resources. Indirect effects from the No Action alternative could include loss of lake clarity resulting from AIP establishment across the Project Area.

3.2.3 Environmental Impacts of the Proposed Project Alternative

Table 3.2-1: Aesthetics, Scenic Resources/Community Design and Light and Glare

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.2-1. Have a substantial adverse effect on a scenic vista? (CEQA Ia)			X	
3.2-2. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a state scenic highway? (CEQA Ib)				X
3.2-3. Substantially degrade the existing visual character or quality of public views			X	

of the site and its surroundings? (CEQA Ic)				
3.2-4. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area? (CEQA Id)				**X**
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.2-5. Be visible from any state or federal highway, Pioneer Trail or from Lake Tahoe? (TRPA item 18a)				**X**
3.2-6. Be visible from any public recreation area or TRPA designated bicycle trail? (TRPA item 18b)				**X**
3.2-7. Block or modify an existing view of Lake Tahoe or other scenic vista seen from a public road or other public area? (TRPA item 18c)				**X**
3.2-8. Be inconsistent with the height and design standards required by the applicable ordinance or Community Plan? (TRPA item 18d)				**X**
3.2-9. Be inconsistent with the TRPA Scenic Quality Improvement Program (SQIP) or Design Review Guidelines? (TRPA item 18e)				**X**
3.2-10. Include new or modified sources of exterior lighting? (TRPA item 7a)				**X**
3.2-11. Create new illumination which is more substantial than other lighting, if any, within the surrounding area? (TRPA item 7b)				**X**
3.2-12. Cause light from exterior sources to be cast off-site or onto public lands? (TRPA item 7c)				**X**
3.2-13. Create new sources of glare through the siting of the improvements or through the use of reflective materials? (TRPA item 7d)				**X**

Discussion

3.2-1. Would the Project have a substantial adverse effect on a scenic vista? (CEQA Ia)

<u>Less than Significant Impact</u>. There are a number of designated scenic vistas in the vicinity of the Project Area. These include the roadway and shoreline travel route units defined by TRPA in their Scenic Resources Inventory (Wagstaff and Brady 1982) that encircle Lake Tahoe, views of the Truckee River from SR 89 and the adjacent shared-use bike trail, and views of the Upper Truckee River from US 50 and adjacent bike trails and public areas.

None of the control methods would permanently impact scenic vistas. Methods such as hand pulling or diver-assisted suction would not be perceptible. Use of dredging machinery would be temporarily visible, but would not be used to remove vegetation, rock outcrops, or other visual features above the water line. UV-C control methods would add a boat operation on Lake Tahoe, however, the addition of a boat would not create an adverse effect. Impacts to scenic vistas from deployment and removal of benthic barriers or LFA systems within Lake Tahoe will consist of temporary buoy use at the control sites. Boats and buoys are a very common fixture on Lake Tahoe so their use for barrier or aeration installation will not change views of scenic vistas. The black benthic barriers may be visible by boaters and travelers adjacent to the shoreline, but a fine sediment layer covers the barriers within days, making them difficult to see unless a viewer is specifically looking for them, resulting in a less than significant impact. Likewise, LFA systems would be used only in areas with some degree of enclosure and would be beneath the surface of the water, making them difficult to see. Air compressors used to operate the aeration systems would be located within mechanical equipment rooms at the marinas and would not be visible or require the construction of large structures. The proposed actions would have a beneficial impact on scenic vistas by improving lake clarity.

3.2-2. Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? (CEQA Ib)

No Impact. The Project Area and potential control sites are visible from California and Nevada Scenic Highways. However, control actions would occur under the surface of Lake Tahoe and a considerable distance from most viewpoint locations, resulting in a less than significant impact. No trees, rock outcroppings or historic buildings would be affected.

3.2-3. Would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (CEQA Ic)

Less than Significant Impact. Barrier deployment would be temporary in nature with barriers installed and removed during a period of six weeks to 24 months. Likewise, the other control methods (dredging, UVC light control, hand-pulling, and diver assisted suction removal) would be temporary, occurring over a period of a few days or weeks in a year. Aeration systems can be used on a longer term basis, but are only used in enclosed areas and are difficult to see unless they are actively sought. Air compressors used to operate the aeration systems would be located within mechanical equipment rooms at the marinas and would not be visible or require the construction of large structures. The existing visual character of the site would not be permanently altered and because of the minimal visibility of the barriers or dredging and UVC control equipment on land or boat, the impacts to visual character and quality would result in a less than significant impact. Control actions designed to improve water quality and clarity are expected to result in long-term beneficial effects to the visual quality of the Project Area and surroundings.

3.2-4. Would the Project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area? (CEQA Id)

No Impact. Interference with nighttime skies from ground level light and glare or interference with vision due to reflective glare constitutes a significant impact. Depending on recreation uses of a control site, Project activities at times may be performed at night using lighting to avoid user conflicts. UVC control systems do not cause light or glare to reflect outside the treatment area as UVC waves are directed downward, directly onto the plants to be treated. However, the Project does not create a new permanent source of light or glare and would therefore result in a less than significant impact.

3.2-5. Would the Project be visible from any state or federal highway, Pioneer Trail or from Lake Tahoe? (TRPA 18a)

No. As discussed in Questions 3.2-1 through 4, some control methods are visible on the lake and along tributaries and marshes; however, the control methods are temporary and may only be visible for a few days, or in the case of benthic barriers, up to two years when observed looking directly down into the water. Likewise, LFA systems would not be generally visible, except when observed from directly above within the water. These actions would not adversely affect the scenic quality or characteristics of the area as viewed from highways, Pioneer Trail, or Lake Tahoe. Control of aquatic invasive plants will have a long-term beneficial impact by improving water clarity.

3.2-6. Would the Project be visible from any public recreation area or TRPA designated bicycle trail? (TRPA 18b)

Visible from public recreation areas, but No Impact. See the discussion and analysis for Questions 3.2-1 through 5, above. The benthic barriers may be visible by boaters and travelers adjacent to the shoreline, but a fine sediment layer covers the barriers within days, making them difficult to detect unless a viewer is specifically looking for them. Although AIP control activities would be visible where they occur in public recreation areas while the actions are implemented, the temporary visibility of these actions would not adversely affect the overall scenic quality of the area and would improve the scenic quality in the long-term.

3.2-7. Would the Project block or modify an existing view of Lake Tahoe or other scenic vista seen from a public road or other public area? (TRPA 18c)

No. Please see the discussion and analysis for Questions 3.2-1 through 5, above. As previously noted, dredging equipment located onshore or on boats and UVC control vessels can be visible, as well as benthic barriers, or underwater tubing and diffusers for aeration systems; however, these pieces of equipment would not block views and would not be permanent. Air compressors used to operate the aeration systems would be located within mechanical equipment rooms at the marinas and would not be visible or require the construction of large structures.

3.2-8. Would the Project be inconsistent with the height and design standards required by the applicable ordinance or Community Plan? (TRPA 18d)

No. No permanent or temporary constructed structures are proposed. The benthic barriers would be installed for a period up to two years; however, these flat barriers would not be subject to height or design standards. Likewise, aeration systems would be located beneath the water line and would not be subject to height or design standards. Air compressors used to operate the aeration systems would be located within mechanical equipment rooms at the marinas and would not be visible or require the construction of large structures.

3.2-9. Would the Project be inconsistent with the TRPA Scenic Quality Improvement Program (SQIP) or Design Review Guidelines? (TRPA 18e)

No. No permanent or temporary constructed structures are proposed that would affect the SQIP or Design Review Guidelines. The benthic barriers would be installed for a period up to two years; however, these flat barriers would not be subject to height or design standards, nor would the aeration piping systems for LFA control methods. No permanent change is proposed; however, the project has the potential to improve lake, tributary, and marsh clarity, which contributes to an overall improvement in the scenic quality of the area.

3.2-10. Would the Project include new or modified sources of exterior lighting? (TRPA 7a)

No. See discussion and analysis for Question 3.2-4.

3.2-11. Would the Project create new illumination, which is more substantial than other lighting, if any, within the surrounding area? (TRPA 7b)

No. See discussion and analysis for Question 3.2-4 and 3.2-12. Although UVC control methods would briefly emit light when treating an infestation, this temporary increase in lighting would not cause a significant impact, would be directed downward to effectively treat AIP, and would not be permanent. Although new illumination would occur, lighting would not be considered more substantial than other lighting because it would be used briefly and temporarily. During the day, the added light would be imperceptible.

3.2-12. Would the Project cause light from exterior sources to be cast off-site or onto public lands? (TRPA 7c)

No. See discussion and analysis for Question 3.2-4. UVC control systems do not cause light or glare to reflect outside the treatment area as UVC waves are directed downward, directly onto the plants to be treated. Due to the location of the infestations, UVC control methods may be used within public lands located below the waterline; however, this would be a focused, temporary treatment method and not permanent lighting of public lands.

3.2-13. Would the Project create new sources of glare through the siting of the improvements or through the use of reflective materials? (TRPA 7d)

No. See discussion and analysis for Question 3.2-4.

3.2.4 NEPA Analysis of Effects

According to the 2016 Forest Plan, Taylor Creek is an Eligible Recreational River Segment Special Area. The minimum scenic integrity for LTBMU areas adjacent to Lake Tahoe and Project Area tributaries is "High". The Forest Plan minimum scenic stability map includes areas ranging from High to Moderate to Low Stability.

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. The impact analysis addresses NEPA Intensity Factors 1, 3, and 7.

Issue - Visual Disruption

Direct and Indirect Effects

Active treatment areas can temporarily, but not substantially, alter views and the unique visual characteristics of the area (NEPA Intensity Factor 3). The addition of barge-mounted or land-operated dredging equipment or boats or other apparatus used for UVC control, diver-assisted suction removal or dredging adds an atypical scenario to the existing view; however, these methods would be utilized for a short period of time, and would not alter views greater than other boating vessels that may use the area or marina operations. Dredging would be limited to marinas in which dredging activity has been previously permitted and may only occur to the extent and depth of previous dredging activity, and would not occur within tributaries or marsh areas. Therefore, no substantial disruption or adverse effect would occur. Likewise, the placement of benthic barriers or other longer-term underwater control methods, such as aeration devices would somewhat alter views into the lake or of the riverbed when observed near the water line; however, views of such control methods would be limited and would not permanently alter views such that the quality of the view was significantly compromised. Additionally, sediment collection over the barriers or equipment would reduce the visibility of the equipment when observed from above the waterline. Although these methods would be employed over a period of months, rather than days, they would be temporary and would not permanently alter views into the water. Hand removal of AIP would result in no visual impact. Staging and access areas located in parking lots or on beach areas adjacent to the control site would include fencing, signage, and material storage; however, they would also be used temporarily and result in the creation of no permanent structures that alter the natural visual quality of the area. Following implementation of the control activity, monitoring activities would result in no visual change or disruption. A goal of the Project would be to improve water clarity, thereby benefitting the visual environment. Implementation would result in a long-term beneficial visual effect.

Cumulative Impacts

No adverse cumulative impacts of the proposed action would occur as AIP control would be spread out in multiple areas and over a period of years, resulting in no concentration of action that would cause an adverse cumulative visual impact. Additionally, control actions would be completed over short periods of time at each control site, so that a cumulatively considerable impact would not occur. The impact of enacting control actions in multiple areas around Lake Tahoe, including within tributaries and marshes, would result in a cumulatively beneficial impact through the improvement of water clarity and resource improvement.

3.2.5 Environmental Commitments and Mitigation Measures

The analysis of impact on scenic resource determines no significant impact would occur and no mitigation measures or RPMs are necessary because the impacts are less than significant.

3.3 AGRICULTURE AND FORESTRY RESOURCES

Some TRPA checklist items concern impacts to vegetation, which are addressed in Section 3.5, Biological Resources.

3.3.1 Setting

The Williamson Act of 1965 is the state's principal policy for the preservation of agricultural land (CDOC 2016). The program encourages landowners to work with local governments to protect important farmland.

Project activities would occur in the underwater portion of control sites and would involve site access using developed Lake access points. The Lake shoreline supports mature and second growth mixed-conifer forest, riparian habitats, wet and dry meadows, and rocky slopes. Agricultural operations and farmland are not located within the Project Area and the control sites do not adjoin any agricultural lands. Neither Lake Tahoe nor adjacent lands (federal, state, or private) are enrolled per the Williamson Act (CDOC El Dorado and Placer 2016). None of Lake Tahoe or the area immediately surrounding the Project Area is included in any of the Important Farmland categories, as delineated by the California Department of Conservation under the Farmland Mapping and Monitoring Program (CDOC 2016).

The Nevada Department of Agriculture identifies no important agricultural land within the project area (agri.nv.gov, 10/7/19).

While forest land can be found in the region of the project, the actual project footprint and impact area is not within forested areas or timber harvest operations.

3.3.2 Environmental Impacts of the No Action Alternative

The No Action Alternative results in no direct or indirect effects on prime or unique farmlands because the Project Area is not located within or adjacent to any prime or unique farmlands.

3.3.3 Environmental Impacts of the Proposed Project Alternative

Table 3.3-1: Agriculture and Forestry Resources				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.3-1. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the CA Resources Agency, to a non-agricultural use? (CEQA IIa)				**X**
3.3-2. Conflict with existing zoning for agricultural use, or a Williamson Act contract? (CEQA IIb)				**X**
3.3-3. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resource Code section 12220(g), timberland (as defined by Public Resource Code section 4526) or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? (CEQA IIc)				**X**
3.3-4. Result in the loss of forest land or conversion of forest land to non-forest use? (CEQA IId)				**X**
3.3-5. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? (CEQA IIe)				**X**

Discussion

3.3-1. Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to a non-agricultural use? (CEQA IIa)

No Impact. The Project Area does not contain Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. Because no lands designated Prime Farmland, Unique Farmland or Farmland of Statewide Importance exist within the Project Area, the Project results in no impact to these resources.

3.3-2. Would the Project conflict with existing zoning for agricultural use, or a Williamson Act contract? (CEQA IIb)

No Impact. The Project Area is not zoned for agricultural use, and does not contain any Williamson Act contracts. Because no such zoning exists within the Project Area, the Project results in no impact to these resources.

3.3-3. Would the Project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resource Code section 12220(g), timberland (as defined by Public Resource Code section 4526) or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? (CEQA IIc)

No Impact. The Project Area is not zoned for forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)). Because the Project area contains no lands with these designations, the Project results in no impact to these resources.

3.3-4. Would the Project result in the loss of forest land or conversion of forest land to non-forest use? (CEQA IId)

No Impact. The Project does not result in the loss of forest land or conversion of forest land to non-forest use. Because forest land does not exist within the Project Area, the Project creates no impact to this resource.

3.3-5. Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? (CEQA IIe)

No Impact. Because designated Farmland, forest land, timberland, or land zoned for timber production does not exist within the Project Area, the Project creates no impact to these resources.

3.3.4 NEPA Analysis of Effects

There are no agricultural or timber production lands in the project area and no direct, indirect or cumulative effects would occur.

3.3.5 Environmental Commitments and Mitigation Measures

The analysis of impacts on agricultural and forestry resource analysis determines no significant impact occurs and no mitigation measures or RPMs are necessary.

3.4 AIR QUALITY

This section describes the air quality conditions in the Project Area and analyzes potential project-related impacts to air quality in the Lake Tahoe Basin.

3.4.1 Setting

Lake Tahoe sits in a high-elevation basin bound by the Sierra Nevada Mountains to the west and the Carson Range to the east. Local sources are the most significant contributor of pollutants and include vehicle exhaust, urban and forest wood smoke, and dust. Air pollution sources from outside the basin include Sacramento and San Francisco Bay Area urban pollutants and smoke from wildfires. The Lake Tahoe Air Basin is comprised of the eastern portions of Placer and El Dorado Counties in California and the western portions of Washoe, Douglas, and Carson City Counties in Nevada that encompass the Lake Tahoe hydrographic basin (CARB 2008).

Climate. The climate of the Lake Tahoe region is generally Mediterranean, but is modified by topography and geography. It is characterized by relatively warm, dry summers, interrupted by occasional lightning storms, and cold, wet winters with variable precipitation, mostly falling as snow (O'Hara et al. 2007). Weather conditions can change rapidly as upper level wind currents and pressure systems in the western states shift locations and both dry and wet frontal systems move through the mountainous terrain. The topographic condition of the Lake Tahoe Basin surrounded by high mountains has a tremendous influence on local weather conditions and the resulting air quality. Lake Tahoe can experience both surface-based and subsidence inversions. Surface-based inversions form when cool air settles down into the basin replacing the warmer surface air, resulting in the warm air rising and creating a lid over the basin, which traps the air below. These surface-based inversions generally begin late evening and lift during mid-morning as the sun warms the atmosphere. Subsidence inversions result from high pressure centered over the region. The high pressure compresses the atmosphere, creating a lid over the basin. These high-pressure systems are common during the summer and fall, and may persist for long periods.

Sensitive Receptors. Sensitive air receptors are people and facilities that are more susceptible to the effects of air pollution than are the general public. Examples of sensitive receptors include health care facilities, rehabilitation centers, schools, child-care centers, and athletic facilities. Residences, schools, playgrounds, child-care centers, and athletic facilities are located within ¼-mile of the Project Area.

Air Quality Standards. Public landowners and managers are subject to air quality planning programs required by the federal Clean Air Act of 1970 (CAA), its 1990 amendments, and within California, the California Clean Air Act of 1988 (CCAA). Both the federal and state clean air statutes provide for ambient air quality standards related to air pollutants, timetables for progressing toward achieving and maintaining ambient standards, and the development of plans to guide air quality improvement efforts by state and local agencies. Ambient air pollutants called criteria pollutants are pollutants for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set. The criteria pollutants of primary concern in the Project Area are carbon monoxide (CO), ozone (O_3), nitrogen oxides, and particulate matter.

The USEPA is responsible for setting National Ambient Air Quality Standards (NAAQS) and established national area designations for six criteria pollutants after the passage of the Clean Air Act of 1970 (USEPA 2008). These pollutants include CO, O_3, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), particulate matter 10 microns or less in diameter (PM_{10}), and particulate matter 2.5 microns or less in diameter ($PM_{2.5}$). If an area does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant, it is designated as "non-attainment." If an area meets the national primary or secondary ambient air quality standard for the pollutant, it is designated in "attainment." An area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant is designated "unclassifiable" (USEPA 2008). The Nevada Division of Environmental Protection (NDEP) utilizes the National Ambient Air Quality Standards.

The California Air Resources Board (CARB) is the lead state agency responsible for air quality and for assisting local air districts in California. CARB has set California area designations for ten criteria pollutants including ozone, PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2, sulfates, Pb, hydrogen sulfide, and visibility reducing particles (VRPs). If a pollutant concentration is lower than the standard, the area is classified as "attainment" for that pollutant. If an area exceeds the standard, the area is classified as "non-attainment" for that pollutant. If there are not enough data available to determine whether the standard is exceeded in an area, the area is designated "unclassified" (CARB 2018).

The Project Area is within the jurisdiction of the El Dorado County Air Quality Management District, Placer County Air Quality Management District, NDEP's Bureau of Air Pollution Control, and Washoe County Health District's Air Quality Management Division. The TRPA acts as the lead air quality planning agency in the Lake Tahoe Basin.

TRPA responsibilities include controlling or mitigating air pollution through land use decisions and local ordinances. Chapter 65, Section 65.1 of the TRPA Code of Ordinances addresses Air Quality Control.

CARB monitored the entire Lake Tahoe Air Basin for ambient air quality via a multi-agency cooperative agreement with NDEP. Currently, the Lake Tahoe Air Basin is classified as attainment or unclassified/attainment for the National Air Quality Standards criteria pollutants (CARB 2018). It is in attainment or unclassified for the California Ambient Air Quality Standards for criteria pollutants except for the California State 24-hour Particulate Matter 10 (PM_{10}); however, it is in attainment for the annual average standard (Table 3.4-1).

Table 3.4-1

Air Quality Standards - 2019 Lake Tahoe Air Basin Air Quality Designations

Pollutant	State Designation	National Designation
Ozone	Attainment	Unclassified/Attainment
PM_{10}	Non-Attainment	Unclassified/Attainment
$PM_{2.5}$	Unclassified	Unclassified/Attainment
Carbon Monoxide	Attainment	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified/Attainment
Sulfates	Attainment	Not Applicable (NA)
Lead	Attainment	Unclassified/Attainment
Hydrogen Sulfide	Unclassified	NA
Visibility Reducing Particles	Unclassified	NA

Source: CARB 2017, 2018

TRPA uses air quality data for the Lake Tahoe Basin to evaluate if the TRPA air quality threshold is met. In the TRPA 2015 Threshold Evaluation Report, CO is listed as "considerably better than target", ozone is listed as "at or somewhat better than target", although the highest 8-hour average concentration is listed as "somewhat worse with moderate improvement", vehicle miles traveled is listed as "at or somewhat better than target", and visibility is listed as "at or somewhat better than target" but data is unavailable for three of the indicators and so confidence in the conclusion is listed as low (TRPA 2016).

3.4.2 Environmental Impacts of the No Action Alternative

The No Action alternative results in no direct or indirect effects to air quality because no AIP control actions would occur.

3.4.3 Environmental Impacts of the Proposed Action Alternative

Table 3.4-2: Air Quality				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.4-1. Conflict with or obstruct implementation of the applicable air quality plan? (CEQA IIIa)				X
3.4-2. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under applicable federal or state ambient air quality standards? (CEQA IIIb)		X		
3.4-3. Expose sensitive receptors to substantial pollutant concentrations? (CEQA IIIc)			X	
3.4-4. Result in other emissions, such as objectionable odors, adversely affecting a substantial number of people? (CEQA IIId)			X	
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.4-5. Substantial air pollutant emissions? (TRPA 2a)				X
3.4-6. Deterioration of ambient (existing) air quality? (TRPA 2b)				X
3.4-7. Creation of objectionable odors? (TRPA 2c)				X

Discussion

3.4-1. Would the Project conflict with or obstruct implementation of the applicable air quality plan? (CEQA IIIa)

No Impact. Project activities would not conflict with, or obstruct the fulfillment of any applicable air quality plan for the Air Quality Management Districts and Divisions. No impact.

3.4-2. Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under applicable federal or state ambient air quality standards? (CEQA IIIb)

Less than Significant with Mitigation Measures. The Project activities would not result in a considerable net increase of any criteria air pollutant. Equipment necessary for removing plants from Lake Tahoe through hand suction includes a water injection system that uses a small 4-stroke gas powered engine. These engines are similar to those used on residential lawn mowers. Installation of benthic barriers and hand pulling are done by hand, with the only emissions generated by the vehicles locally transporting the barrier materials and installation personnel. UVC light-systems are operated from a boat with a small tiller motor, releasing fewer emissions than the private boats in the marina being treated. Aeration systems require the transport of materials and personnel and the use of some energy to operate the aerator; however, the energy required would be low and no measurable increase in pollutants would occur. The proposed action includes the potential use of mechanical or suction dredging in marina areas where dredging has been previously conducted. Dredging operations may include a hydraulic cutter with a suction pipeline and collection device mounted to a boat or barge, a bucket dredger and barge, a backhoe dredger located onshore or on marina facilities and collection barge, and other similar equipment that utilize diesel powered combustion engines. Diesel emissions pollutants include unburned hydrocarbons, carbon monoxide, nitrogen oxides and/or particulate matter (DieselNet 2019). Dredging machinery use would be limited as only areas previously treated through dredging would utilize this method, leaving this option feasible at a small number of marinas. If dredging occurs, it would occur over a period of days. The emissions would be similar to a small construction project, such as a small roadway repair. The dredged material has the potential to also create small levels of air emissions when dried and transported; however, collected materials, although often dried to reduce transport weight and volume, would be enclosed within a dumpster. Although there is potential to release diesel fuel emissions, the short-term nature of the emissions, and small volume of equipment used during the dredging operation would not substantially contribute to a cumulatively conservable net increase in pollutants. However, if dredging occurs, idling restrictions for on-road and off-road construction equipment would be required to comply with California Air Resources Board regulations and California law developed to address poor air quality in California. In addition, Lake Tahoe is a non-attainment area for PM_{10} and fugitive dust mitigation should be implemented to reduce fugitive dust where mechanical dredging equipment is based on or crosses over land. Therefore, it is recommended that **MITIGATION MEASURES AQ-1** and **AQ-2** are implemented.

3.4-3. Would the Project expose sensitive receptors to substantial pollutant concentrations? (CEQA IIIc)

Less than Significant Impact. A sensitive receptor is generally defined as a person in the population who is particularly susceptible to health effects due to exposure to an air contaminant than is the population at large. Sensitive receptors (and the facilities that house them) in proximity to localized CO sources, toxic air contaminants or odors are of particular concern. Project activities would be performed at great distances to potential sensitive receptors, primarily under water and primarily with equipment that minimizes the creation of air borne pollutants. Equipment used for dredging would be confined to marinas. Likewise, aeration devices would also be limited to marina areas and would not produce measurable pollutant concentrations. UVC light control methods would occur via boat with a small motor, typically in marina areas and would not produce a greater volume of emissions than other watercraft in the area. Because Project activities would not release substantial pollutant concentrations and because the control sites would not be located in close proximity to sensitive receptors, no impact occurs.

3.4-4. Would the Project result in other emissions, such as objectionable odors, adversely affecting a substantial number of people? (CEQA IIId)

Less than Significant Impact. Project activities would create no objectionable odors affecting a substantial number of people because of the nature of AIP control actions. Some odors may be created if dredging occurs due to equipment use; however, the odors would not be substantial, would occur only within a marina area, and would be temporary. Air compressors associated with aeration devices would not produce significant odor, nor would the bubbles produce significant odors as they reach the surface. UVC light vessels and diver-assisted suction would utilize a vessel or small machinery, but no significant odor would be produced. No odors are produced by benthic barriers. No impact would occur.

3.4-5. Would the Project result in substantial air pollutant emissions? (TRPA 2a)

No. See analyses for Question 3.4-2.

3.4-6. Would the Project result in deterioration of ambient (existing) air quality? (TRPA 2b)

No. See analyses for Questions 3.4-2. and 3.4-5.

3.4-7. Would the Project result in creation of objectionable odors? (TRPA 2c)

No. See discussion and analysis for Question 3.4-4.

3.4.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. The impact analysis addresses NEPA Intensity Factors 1, 2, 7, and 10.

Issue - Increase Air Emissions

Direct and Indirect Effects

There are no indirect air emissions effects associated with the control methods, but the quantity of direct emissions varies by the methodology used. Methods such as monitoring, benthic barriers, and hand pulling are only associated with emissions related to personnel vehicle use to access the control site, whereas dredging would utilize diesel-powered equipment that produce some levels of emissions and may be stationed on land, which could produce fugitive dust. Diver-assisted suction and UV-C light treatment produce small emissions due to use of watercraft or small equipment. Aeration devices would not produce significant emissions and associated air compressors would contribute little to emissions. Implementation of control actions would not produce substantial emissions so as to exceed Federal Air Quality standards or affect human health. To reduce mechanical equipment emissions and fugitive dust, Mitigation Measures AQ-1 and AQ-2 are RPMs that implement Forest Plan Standard SG3 (Control fugitive dust as needed during ground disturbing activities and periods of intensive road use).

Cumulative Impacts

The cumulative impacts of the proposed action include small contributions to fugitive dust and diesel emissions when dredging methods are used. The contribution to these effects by the project is not cumulatively considerable, particularly since dredging would be used on a limited basis and implementation of the dredging activity would occur over the course of a few days. In conjunction with other projects in the area, including simultaneous AIP and AIS control, roadway improvements, buoy relocation and pier projects, rafting permits, and ferry services, the Proposed Action would not significantly contribute to a cumulative air quality impact because the control activities occur over a short period of time, and most control methods result in little to no emissions, with the exception of dredging, which would have limited application.

3.4.5 Environmental Commitments and Mitigation Measures

The air quality analysis determines that **MITIGATION MEASURES AQ-1** and **AQ-2** are necessary to reduce potential impacts to dust emissions and comply with area regulations pertaining to idling and emissions to a level of less than significant.

Mitigation Measure AQ-1: Idling Restrictions

The dredging contractors shall minimize idling time of heavy dredging equipment by:

- Shutting equipment off when not in use or reducing the time of idling to 5 minutes, as required by Title 13, Sections 2449(d) and 2485 of the California Code of Regulations;

- Prohibiting idling within 1,000 feet of sensitive receptors, such as schools, care centers, and residences; and
- Educating workers of the idling restrictions discussed above.

Mitigation Measure AQ-2: Dust Control Measures

- Minimize creation of fugitive dust where dredging equipment or disposal bins are located on land by applying water to exposed soils.
- Vehicles accessing control areas over unpaved surfaces shall limit their speed to 5 miles per hour.
- Paved staging areas shall be swept clean following implementation of control actions using staging areas for material or equipment storage.

3.5 BIOLOGICAL RESOURCES

This section describes the conditions of biological resources in the Project Area and analyzes potential impacts to aquatic and terrestrial wildlife and vegetation, Special-Status Species, their habitats, Sensitive Natural Plant Communities Wetlands and Waters of the US, stream environment zones (SEZs), and local policies protecting biological resources.

3.5.1 Setting

The nearshore and foreshore environments associated with Lake Tahoe support a diverse assemblage of biological resources. The Project activities are located within the Lake Tahoe Basin including the Lake itself, tributaries and adjacent marshes of Lake Tahoe and the Upper and Lower Truckee Rivers as they flow into or out of Lake Tahoe within TRPA's jurisdiction to a maximum depth of 30 feet. Upland vegetation is typical of the eastern Sierra Nevada consisting of Sierran Mixed Conifer, Jeffrey Pine, Montane Riparian and Wet Meadow habitats. The Lake Tahoe Basin provides habitat for over 262 species of resident and migratory vertebrate wildlife species. Based on the Lake Tahoe Watershed Assessment (Murphy and Knopp 2000), each of these species of mammals (66), birds (262), and reptiles (8) and amphibians (6) occur in the region because certain habitats are available to meet their needs. A total of 13 fish species (both native and introduced), occupy the waters of Lake Tahoe. The quality and size of the wide variety of habitats present generally determine the abundance of any one species or animal population.

Special-Status Species

Sensitive biological resources that potentially could occur in or near the control sites are discussed in this section. Special-status species (sensitive species) are defined as plants and animals that are legally protected or that are considered sensitive by federal, state, or local resource conservation agencies and organizations. Specifically, this list includes:

1. Species listed as state or federally Threatened or Endangered;
2. Species considered as candidates or proposed for listing as Threatened or Endangered;
3. Species identified by the CDFW as Species of Special Concern;
4. Species identified by CDFW as Fully Protected or Protected;
5. Species identified as At-Risk by Nevada Natural Heritage Program;
6. Forest Service Sensitive species as determined by US Forest Service, Region 5;
7. Species of Special Interest as identified by the TRPA;
8. Plants considered by the California Native Plant Society (CNPS) to be rare.

Special-status species and their habitats were evaluated for potential impacts from the Project. Existing available data were collected and reviewed to determine the proximity of special-status plants, animals, and their habitats to the control sites. Queries of the Nevada Natural Heritage Program database, CDFW California Natural Diversity Database (CNDDB) (2019), the California Native Plant Society's On-line Inventory (CNPS 2019), and the US Fish and Wildlife Service (USFWS 2019) were conducted for special-status species and habitats within the United States Geological Survey (USGS) 7.5 minute quadrangle maps surrounding Lake Tahoe.

Special-status plant and animal species are described below along with their potential to occur at the control sites and the impacts this Project could cause to these species.

Plant Species

The initial review of available information identified 21 special-status plant species that could occur in or near the Project Area. Table 3.5-1 summarizes the potential for occurrence of each special-status plant species that was evaluated during this analysis. One plant community of local interest (TRPA) is also reviewed, and may have the potential to occur in the vicinity of the Project Area. The botany analysis area encompasses approximately 15,600 acres and consists of the AIP control actions, access roads to the project area, and an area approximately 50 feet around proposed activities.

Table 3.5-1

Special-Status Plant Species

Species	Status*	Habitat Characteristics	Known to occur in botany analysis area	Potential habitat in botany analysis area
Arabis rigidissima var. *demota* Galena Creek rock cress	S, 1B	Open, rocky areas along forest edges of conifer and/or aspen stands; usually found on north aspects; 7,500 ft. & above.	N	N
Boechera tiehmii Tiehm's rock cress	S, 1B	Open rocky soils in the Mt. Rose Wilderness; 10,000 ft. & above.	N	N
Boechera tularensis Tulare rock cress	S, 1B	Shaded, mostly east-facing subalpine rocky areas, including rocky slopes, rock-lined streams and seeps, rocky outcrops, saddles, and canyons; 6,000- 11,000 ft.	N	N
Botrychium spp. Moonwort spp.		*Botrychium* species are found in similar habitat; wet or moist soils such as marshes, meadows, and along the edges of lakes and streams; generally occur with mosses, sedges, rushes, and other riparian vegetation; 2,000-10,000 ft.	N	Y
Botrychium ascendens upswept moonwort	S, 2B	See *Botrychium* spp.	N	Y
Botrychium crenulatum scalloped moonwort	S, 2B	See *Botrychium* spp.	N	Y

Table 3.5-1

Special-Status Plant Species

Species	Status*	Habitat Characteristics	Known to occur in botany analysis area	Potential habitat in botany analysis area
Botrychium lineare slender moonwort	C, S, 1B	See *Botrychium* spp.	N	Y
Botrychium lunaria common moonwort	S, 2B	See *Botrychium* spp.	N	Y
Botrychium minganense Mingan's moonwort	S, 2B	See *Botrychium* spp.	N	Y
Botrychium montanum western goblin	S, 2B	See *Botrychium* spp.	N	Y
Brasenia schreberi watershield	2B	Freshwater marshes and swamps. Aquatic from water bodies both natural and artificial in California. Blooms June-September	Y	Y
Bruchia bolanderi Bolander's candle moss	S, 2B	Mainly in montane meadows and stream banks, but also on bare, slightly eroding soil where competition is minimal.	N	Y
Carex davyi Davy's sedge	1B	Dry often sparse meadows, slopes. Subalpine coniferous forest, upper montane coniferous forest.	Y	Y
Carex limosa mud sedge	2B	Perennial rhizomatous herb. Bogs and fens, lower montane coniferous forest, meadows, marshes and swamps, upper montane coniferous forest. In floating bogs and soggy meadows and edges of lakes. 1200-2775 m. Blooms June-August.	N	Y
Claytonia megarhiza fell fields claytonia	2B	Perennial herb growing in crevices between rocks, alpine boulder and rock fields in subalpine coniferous forest between 8,500-10.800.	N	N
Dendrocollybia racemosa Dendrocollybia	S	On old decayed or blackened mushrooms or occasionally in coniferous duff, usually within old growth stands.	Y	Y
Draba asterophora var. *asterophora* Tahoe draba	S, SI, 1B	Rock crevices and open granite talus slopes on north-east slopes; 8,000- 10,200 ft.	N	N
Draba asterophora var.	S, SI, 1B	Steep, gravelly or rocky slopes; 8,400-9,300 ft.	N	N

Table 3.5-1

Special-Status Plant Species

Species	Status*	Habitat Characteristics	Known to occur in botany analysis area	Potential habitat in botany analysis area
macrocarpa Cup lake draba				
Draba cruciata Mineral king draba		Subalpine gravelly or rocky slopes, ridges, crevices, cliff ledges, sink holes, boulder and small drainage edges; 7,800-13,000 ft.	N	N
Erigeron miser Starved daisy	S, 1B	Granitic rock outcrops; 6,000 ft. & above	N	N
Eriogonum luteolum var saltuarium Goldencarpet buckwheat	S	Sandy granitic flats and slopes, sagebrush communities, montane conifer woodlands; 5,600-7,400 ft.	N	N
Eriogonum umbellatum var. *torreyanum* Donner Pass buckwheat	S, 1B	Dry gravelly or stony sites; often on harsh exposures (e.g. ridge tops, steep slopes)	N	N
Glyceria grandis American manna grass	2	riparian, streambanks, lake-margins, meadows, bogs/fens, edges	N	Y
Helodium blandowii Blandow's bogmoss	S	Bogs, fens, wet meadows, and along streams under willows.	N	Y
Hulsea brevifolia shortleaf hulsea	S, 1B	Red fir forest, but also in mixed conifer forests; found on gravelly soils; 4,900-8,900 ft.	N	N
Ivesia sericoleuca Plumas ivesia	S	Associated with seasonally wet meadows, meadow ecotones, terraces and toeslopes on soils which are primarily volcanic in origin. The plant has not been located on granitic soils.	N	N
Lewisia kelloggii spp. Hutchisonii Sierra Valley lewisia	S	Ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil; 5,000-7,000 ft.	N	N
Lewisia kelloggii ssp. kelloggii Kellogg's lewisia	S	Ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil; 5,000-7,000 ft.	N	N
Lewisia longipetala Long-petaled lewisia	S, SI, 1B	North-facing slopes and ridge tops where snow banks persist throughout the summer; often found near snow bank margins in wet soils; 8,000-12,500 ft.	N	N
Meesia triquetra	2B	Bogs and fens, but also very wet meadows.	N	Y

Table 3.5-1

Special-Status Plant Species

Species	Status*	Habitat Characteristics	Known to occur in botany analysis area	Potential habitat in botany analysis area
Meesia uliginosa Broad-nerved hump-moss	S, 2B	Bogs and fens, but also very wet meadows.	N	Y
Orthotrichum praemorsum Orthotrichum moss	S	Shaded, moist habitats of east side of Sierra Nevada rock outcrops; up to 8,200 ft.	N	N
Phacelia stebbinsii Stebbins' phacelia	1B	Lower montane coniferous forest, meadows and seeps, blooms between May-July.	Y	Y
Potamogeton epihydrus Nuttall's ribbon-leaved pondweed	2B	Perennial rhizomatous aquatic herb occurs in marshes and swamps and associated shallow freshwater wetlands. Blooms between July-September.	Y	Y
Rhamnus alnifolia Alder buckthorn	2B	Perennial deciduous shrub found in lower montane coniferous forest, meadows and seeps, riparian scrub, and upper montane coniferous forest.	N	Y
Peltigera gowardii Western waterfan	S	Cold unpolluted streams in mixed conifer forests.	N	N
Pinus albicaulis Whitebark pine	S, C	Subalpine and at timberline on rocky, well-drained granitic or volcanic soils.	N	N
Rorippa subumbellata Tahoe yellow cress	S, SI, SE, 1B	Subalpine and at timberline on rocky, well-drained granitic or volcanic soils.	Y	Y
Scutellaria galericulata Marsh skullcap	2B	Lower montane coniferous forest, meadows and seeps, marshes and swamps; 0-2,100 m. Blooms June-September.	N	Y
Stuckenia filiformis ssp. alpina stuckenie filiformis	2B	Perennial rhizomatous aquatic herb occurs in marshes and swamps and associated shallow freshwater wetlands. Blooms between May-July.	Y	Y

Regulatory Status Codes:

Federal status:

C Species of concern as identified by the U.S. Fish and Wildlife Service

S USDA, Forest Service sensitive species

State Status:

SE Listed as endangered under the California Endangered Species Act

California Native Plant Society Listing Categories (CNPS):

1B Plant species that are rare, threatened, or endangered in California and elsewhere

2B Plant species that are rare, threatened, or endangered in California, but are more common elsewhere

TRPA Status:
SI Species of Special Interest to the Tahoe Regional Planning Agency

Plant Species Known or Likely to Occur in Lake Tahoe with Potential for Presence at or near the Project Area

The following 21 plant species are known to occur or likely to occur in habitats immediately adjacent to Lake Tahoe, its tributaries and the Truckee River and have the potential to be present within or in the vicinity of the Project Area as identified in Table 3.5.1 above: *Botrychium ascendens, Botrychium crenulatum, Botrychium lineare, Botrychium lunaria, Botrychium minganense, Botrychium montanum, Brasenia schreberi, Bruchia bolanderi, Carex davyi, Carex limosa, Dendrocollybia racemosa, Glyceria grandis, Helodium blandowii, Meesia triquetra, Meesia uliginosa, Phacelia stebbinsii, Potamogeton epihydrus, Rhamnus alnifolia, Rorippa subumbellata,* and *Stuckenia filiformis ssp. alpine.* The above species together share habitat requirements that include wet soils that are located along stream banks, meadows and wet areas (bogs/fens/wetlands) associated with lentic and lotic environments with the exception of *Dendrocollybia racemosa* and *Rorippa subumbellata*. These 19 species will be analyzed together below while impacts to *Dendrocollybia racemosa* and *Rorippa subumbellata* will be analyzed separately.

Wildlife Species

The Project will occur underwater in nearshore areas of Lake Tahoe and in the Truckee River and tributaries. Special-status wildlife species that have been documented in association with Lake Tahoe or its tributaries or could potentially occur in or near the Project Area are described below. Other species not known from the area, but included on state or federal database lists, are also discussed. Table 3.5-2 summarizes the wildlife species of interest for the Project. It shows each species that is listed on at least one of the aforementioned sensitive lists, the status of each animal, and the likelihood of it occurring in the Project Area.

Reptiles, amphibians, and fish comprise a relatively small percentage of the wildlife found in the Lake Tahoe Basin. In riparian areas adjacent to and other habitats within the project sites , reptilians that may be found include northern rubber boa (*Charina bottae*), western aquatic garter snake (*Thamnophis couchii*), common garter snake (*Thamnophis sirtalis*) and western terrestrial garter snake (*Thamnophis elegans*). Most amphibians are dependent on streams, ponds, and other water bodies for reproduction and other aspects of their life. Amphibian species include Pacific tree frog (*Pseudacris regilla*) long-toed salamander (*Ambystoma marcodactylum*), western toad (*Bufo boreas*), and Sierra Nevada yellow-legged frog (*Rana sierrae*). Native fish species that may occur in the project area include Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*), Lahontan lake tui chub (*Siphatales bicolor pectinifer*), Lahontan stream tui chub (*Siphatales bicolor obesus*), Paiute sculpin (*Cottus beldingi*), Lahonton redside shiner (*Richardsonius egregious*), Lahontan speckled dace (*Rhinichthys osculus*), mountain whitefish (*Prosopium williamsoni*), mountain sucker (*Catostomus platyrhynchus*), and Tahoe sucker (*Catostonmus tahoensis*). Native invertebrate species that are likely to occur in the project area include, but are not limited to, Great Basin ramshorn snail (*Helisoma newberryi)*, and western pearlshell mussel (*Margaritifera falcata*). The project area also has populations of recreation nonnative fish such as rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), lake trout (*Salvelinus namaycush*), and brown trout (*Salmo trutta*) as well as warm water aquatic invasive species such as American bullfrog (*Rana catesbeiana*), largemouth bass (*Micropterus salmoides*), goldfish (*Carassius auratus*), and bluegill (*Lepomis macrochirus*).

Table 3.5-2

Special-Status Wildlife Species

Common and Scientific Name	Regulatory Status	Habitat	Potential for Occurrence
Bald eagle (*Haliaeetus leucocephalus*)	SE TRPA D – FE	Mature or old-growth trees or snags near a large body of water	**Could occur.** Suitable habitat present, known to occur in proximity to Project Area.
California spotted owl (*Strix occidentalis occidentalis*)	SSC FSS NNHP	Mature and old-growth forest stands	**Not likely to occur.** Suitable habitat is not present in the Project Area.
California wolverine (*Gulo gulo*)	SE FC	Mixed conifer, wet meadow, montane chaparral	**Not likely to occur.** Suitable habitat is not present in the Project Area. Species not known to occur in the LTBMU
Fringed myotis (*Myotis thysanodes*)	NNHP FSS	Montane hardwood conifer forests	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Golden eagle (*Aquila chrysaetos*)	TRPA FP	Cliffs and large trees for cover and nesting, open areas for hunting	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Great Basin rams-horn (*Helisoma newberryi*)	FSS	Soft mud within lakes, rivers, and creeks.	**Could occur.** Occurs in Lake Tahoe, and has been observed in the Truckee River directly downstream of Lake Tahoe, suitable habitat present. (See Furnish, J., 2007. Guide to sensitive aquatic mollusks of the US Forest Service Pacific Southwest Region. *USDA Forest Service, Pacific Southwest Region. 23pp*. See also Taylor-Tallac BA/BE)
Great grey owl (*Strix nebulosa*)	FSS	Breeds in old-growth red fir, mixed conifer, or lodgepole pine habitats, always in the vicinity of wet meadows.	**Not likely to occur.** Suitable habitat is not present in the Project Area. Species not known to occur in the LTBMU
Lahontan lake tui chub (*Siphatales bicolor pectinifer*)	FSS	Found in nearshore waters including rocky areas and aquatic plant beds in Lake Tahoe and lower tributary reaches.	**Could occur.** Occurs in Lake Tahoe, suitable habitat present.
Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi*)	FT	Cold water habitats, including streams and rivers. Flowing water with stable, vegetated banks and riffle-run areas.	**Could occur.** Previously presumed extinct but reintroduction occurred in Lake Tahoe and connected tributaries from 2005 to current.

Table 3.5-2

Special-Status Wildlife Species

Common and Scientific Name	Regulatory Status	Habitat	Potential for Occurrence
Lake Tahoe benthic stonefly (*Capnia lacustra*)	NNHP	Deep-water plant beds in Lake Tahoe from 95 feet to greater than 400 feet in depth.	**Not likely to occur.** Endemic to Lake Tahoe but project activities will not occur in known water depth range of this species.
Long-eared owl (*Asio otus*)	SSC FSS NNHP	Dense conifer stands and riparian thickets near meadow edges	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Long-legged myotis (*Myotis volans*)	NNHP	Forest and chaparral habitats, including early successional stages.	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Mule deer (*Odocoileus hemionus*)	TRPA	Mosaic of vegetation, including dense brush, riparian, herbaceous opening, and edge habitat	**Not likely to occur.** Suitable habitat present adjacent to project but not likely to occur in close proximity to Project Area
Northern goshawk (*Accipiter gentilis*)	SSC TRPA FSS NNHP	Mature and old-growth forest stands	**Could occur.** Suitable habitat present, known to occur in proximity to Project Area
Northern leopard frog (*Lithobates pipiens*)	SSC NNHP	Calm waters within a variety of habitats.	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Osprey (*Pandion haliaetus*)	TRPA	Large snags or other suitable nesting platform within 15 miles of fishable water	**Could occur.** Suitable habitat present, known to occur in proximity to Project Area.
Olive-sided flycatcher (*Contopus cooperi*)	SSC NNHP	Montane conifer forest	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Pacific fisher (*Martes pennanti pacifica*)	FC	Areas of high canopy closure and large trees within coniferous forests and deciduous riparian habitats.	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Pallid bat (*Antrozous pallidus*)	SSC FSS NNHP	Rocky outcrops, cliffs, and crevices for roosting, open habitats for foraging	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Peregrine falcon (*Falco peregrinus*)	SE D - FE TRPA	Woodland and forest in proximity to riparian areas, requires cliffs for nesting	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Sierra marten (*Martes caurina*)	FSS	Mixed conifer forest with greater than 40% crown closure, large trees and snags	**Not likely to occur.** Suitable habitat is not present in the Project Area.

Table 3.5-2

Special-Status Wildlife Species

Common and Scientific Name	Regulatory Status	Habitat	Potential for Occurrence
Sierra Nevada mountain beaver (*Aplodontia rufa californica*)	SSC NNHP	Narrow, shallow stream with willow, alder, fir, and aspen	**Could occur.** Suitable habitat is present along the banks of Lake Tahoe and its tributaries adjacent to the Project Area.
Sierra Nevada red fox (*Vulpes vulpes necator*)	ST	Subalpine forests, mixed conifer, lodgepole pine, and meadows.	**Not likely to occur.** Suitable habitat is not present in the Project Area. Species not known to occur in the LTBMU.
Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*)	SSC NNHP	Montane riparian with alder and willow thickets and young conifer thickets with chaparral	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Sierra Nevada yellow-legged frog (*Rana sierrae*)	FE ST NNHP	Streams, lakes, and ponds in montane riparian, lodgepole pine, and wet meadow	**Could occur.** Suitable habitat is present along in riparian, marsh/wetland and stream habitat in the Project Area.
Townsend's big-eared bat (*Corynorhinus townsendii*)	SSC FSS NNHP	Roosts include caves, mines, and buildings while forages in mesic habitats	**Not likely to occur.** Suitable habitat is not present in the Project Area.
Western bumble bee (*Bombus occidentalis*)	FC FSS	Meadow, riparian and upland habitats that support flowers that produce nectar and pollen.	**Could occur.** Suitable habitat is present along the banks of Lake Tahoe and its tributaries adjacent to the Project Area.
Willow flycatcher (*Empidonax traillii*)	SE FSS	Wet meadow and montane riparian with willow thickets	**Could occur.** Suitable habitat is present along the banks of Lake Tahoe and its tributaries adjacent to the Project Area.
Yellow warbler (*Dendroica petechia*)	SSC	Riparian woodland, montane chaparral, and open conifer forest with substantial shrub	**Could occur.** Suitable habitat is present along the banks of Lake Tahoe and its tributaries adjacent to the Project Area.
Yosemite toad (*Bufo canorus*)	FT	Montane wet meadows and seasonal ponds in lodgepole pine forests.	**Not likely to occur.** Project Area is outside the range of the species.

Regulatory Status Codes:
SSC: California Department of Fish and Wildlife Species of Special Concern
SE: California Department of Fish and Wildlife Endangered
ST: California Department of Fish and Wildlife Threatened
WL: California Department of Fish and Wildlife Watch List
FP: California Department of Fish and Wildlife Fully Protected
D – FE: Delisted United States Fish and Wildlife Service Endangered
TRPA: Tahoe Regional Planning Agency Threshold Species
FSS: United States Forest Service Sensitive

FC: Candidate species for listing by United States Fish and Wildlife Service
NNHP: Nevada Natural Heritage Program At-Risk Species

Wildlife Species Known or Likely to Occur in Lake Tahoe with Potential for Presence at or near the Project Area

The following wildlife species are known to occur or likely to occur in Lake Tahoe, its tributaries, marshes, and the Truckee River and have the potential to be present within or in the vicinity of the Project Area.

Northern Goshawk (*Accipiter gentilis*). The northern goshawk inhabits a broad range of forested communities, including mixed conifer, true fir, montane riparian, Jeffrey pine, ponderosa pine, and lodgepole pine forest. A study of the Sierra Nevada conducted in the Lake Tahoe Basin found that nest-site areas used by northern goshawks were characterized by high canopy closure, high densities of trees in the >60-100 centimeter and >100 centimeter diameter-at-breast-height (dbh) classes, low densities of 5-30 centimeter dbh trees, and low shrub/sapling and ground cover (Keane 1999). Other site factors, including northerly aspects, proximity to water or meadows, forest openings, and low slope angles, have also been associated with nest sites in numerous studies, although these factors vary widely (USFS 2000). Snags and logs are considered important components of northern goshawk foraging areas, as they provide habitat for prey populations (USDA 1988b). Northern goshawk occur in the Project Area, which overlaps with the following Protected Activity Centers (PACs): Cascade, First Creek and Secret Harbor (26 acres total).

<u>Bald eagle (*Haliaeetus leucocephalus*) (nesting and wintering).</u> The bald eagle was delisted under the Federal Endangered Species Act in 2007. However, the bald eagle is a Forest Service Sensitive Species and is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). Bald Eagles in the Lake Tahoe basin can be either year-round residents or winter migrants; very little is known about their year-round activity. Nest trees are often in very large trees in proximity to water and the breeding season generally ranges between February and July (CDFG 2008). Suitable nesting and wintering habitat occur near the Project site along the margins of the lake. There are known nest sites near the mouth of Emerald Bay, in Sugar Pine Point State Park, and one at Marlette Lake Stateline Point. In May 2019, a suspected bald eagle nest territory was identified by NDOW at Skunk Harbor on National Forest Service lands. Bald eagles were observed building a nest.

<u>Great Basin rams-horn (*Helisoma newberryi*).</u> This species is assumed to occur in Lake Tahoe, as the Forest Service has assumed presence (Taylor-Tallac BA/BE), but the distribution is unknown, and the Forest Service has not surveyed for this species in Lake Tahoe. These snails burrow into soft mud of larger lakes and slow rivers. They are often associated with areas of groundwater inflow. The distribution and abundance of this species within Lake Tahoe is unknown. It is likely that suitable habitat for this species exists within the project area and possible that this species occurs at some locations within the project area.

<u>Lake Tahoe benthic stonefly (*Capnia lacustra*).</u> This species is known to occur in Lake Tahoe at depths of 95 to 400 feet where it is associated with native deep-water plant communities. Project activities will not occur in deep water areas and will not impact suitable habitat for this species.

<u>Lahontan lake tui chub (*Siphateles bicolor pectinifer*)</u> are a subspecies of tui chub native to Lake Tahoe and the Truckee River watershed. They are adapted to feeding on zooplankton in lakes and are differentiated from Lahontan creek tui chub (*Siphateles bicolor obesa*), with which they co-occur, by differences in gill raker morphology and feeding strategy (Moyle 2002; Cooper 1985). Lahontan lake tui chub school in large numbers within Lake Tahoe with larger, older individuals found farther offshore in deeper waters and juveniles found in shallow shoreline habitats (Beauchamp et al. 1994). They often utilize rocky areas and aquatic plant beds for cover and feeding. Spawning occurs at night in shallow water less than five feet (1.5m) deep from late April through the end of July

over a variety of substrates such as sand, gravel, cobbles, boulders, algae, and aquatic vegetation (Moyle 2002, Kucera 1978; Beauchamp et al. 1994).

Lahontan lake tui chub face a variety of threats including pollution and shoreline development. However, the primary threat they face is introduced species. Zooplankton food sources in Lake Tahoe have been permanently altered due to the introduction of mysid shrimp and kokanee salmon. Introduced predators such as lake trout (*Salvelinus namaycush*) and largemouth bass (*Micropterus salmoides*) prey on tui chub. Aquatic vegetation beds may provide risky habitat to tui chub because they shelter both the chub and introduced warm-water predators such as largemouth bass (CDFW 2019).

Lahontan Cutthroat Trout (*Oncorhynchus clarkii henshawi).* Lahontan cutthroat trout (LCT) was federally listed as an "endangered" fish species in 1970 (35 FR13520). This federal listing was changed to "threatened" in 1975 in order to further facilitate the species management and to allow for regulated angling (40 FR 29864). In 1995, USFWS released its recovery plan for LCT encompassing six river basins within their historic range, including the Truckee River basin and Lake Tahoe. The Lahontan Cutthroat Trout Recovery Plan (USFWS 1995) identified the need to develop ecosystem plans for the Truckee and Walker River Basins. The Short-term Action Plan for LCT in the Truckee River Basin was released in 2003 U.S. (USFWS 2003). The 5-Year Review for LCT was completed in 2009 (USFWS 2009). Solicitation of information for another 5-year review was initiated in 2013.

LCT is an inland subspecies of cutthroat trout endemic to the Lahontan Basin of northern Nevada, eastern California, and southern Oregon. LCT historically occupied large freshwater and alkaline lakes, small mountain streams and lakes, small tributary streams, and major rivers of the Lahontan Basin of northern Nevada, eastern California, and southern Oregon (USFWS 1995). In northern California and western Nevada, LCT historically was presumed to occupy over 600 miles of stream habitat within the Truckee River watershed (USFWS 2009). Populations in Pyramid and Winnemucca Lakes migrated more than 100 miles up the Truckee River into its headwaters and tributaries to spawn, this migration included Lake Tahoe and its tributaries (Sumner 1940; Peacock et al. 2017). Optimal habitat for Lahontan cutthroat trout is characterized by: (1) clear cold water with an average maximum summer temperature of less than 22 ºC (72 ºF), and relatively stable summer temperature regime averaging about 13 ºC (55 ºF) plus or minus 4 ºC (7 ºF); (2) habitat heterogeneity including complex cover, deep water, and spawning areas; and (3) a relatively silt free rocky substrate in riffle-run areas of tributaries (USFWS 1995). Non-native fish, especially salmonid species such as brook trout (*Salvelinus fontinalis*) and lake trout (*Salvelinus namaycush*), are currently the greatest threat to LCT range wide (USFWS 2009). LCT is an obligate stream spawner and predominantly uses tributary streams as natal spawning sites. Spawning occurs from April – July throughout the range of LCT, depending on stream elevation, stream discharge (annual runoff conditions), and water temperature (USFWS 1995). LCT are opportunistic feeders, preying on aquatic and terrestrial invertebrates that occur in the drift. Terrestrial prey items may make up a significant portion of the diet of trout in small headwater streams and meadows during the summer months. In lakes, smaller trout feed primarily on surface insects and zooplankton and larger trout feed on other fish. Other prey items include bottom-dwelling insect larvae, crustaceans, and snails (Moyle 2002, Vander Zanden et al. 2003).

The decline of LCT throughout its range is attributed to a number of factors including hybridization and competition with non-native trout species; invasive aquatic species, population isolation and habitat fragmentation, habitat condition, drought, water quality, water management (amount and timing of flows), fish movement and migration barriers, effects of wildfire, alteration of stream channels and morphology; loss of spawning habitat due to pollution and sediment from land uses, and loss of habitat due to channelization (USFWS 1995, 2009). The current distribution and abundance of LCT in the lower Truckee River and Lake Tahoe systems is a function of habitat quality and quantity, presence of non-native fish species, stocking programs, flow regimes, and structural barriers to fish passage.

LCT were extirpated from Lake Tahoe and its tributaries in 1939. Recently, the U.S. Fish and Wildlife Service, along with researchers and local partners, began experimenting with the reintroduction of LCT into Fallen Leaf

Lake in 2002 (Al-Chokhachy et al. 2009). The U.S. Fish and Wildlife Service's Lahontan National Fish Hatchery provides the cutthroat for stocking Fallen Leaf Lake and for the programmatic reintroduction back into Lake Tahoe. However, Lake Tahoe has been stocked with lake trout, which is now the top predator. The introduction of lake trout, combined with the introduction of mysid shrimp, has dramatically changed the food chain in Lake Tahoe impairing efforts to establish a self-sustaining lacustrine population there (Vander Zanden et al. 2003).

At Fallen Leaf Lake, the U.S. Fish and Wildlife Service (USFWS 1995) is cooperating with the USDA Forest Service, the California Department of Fish and Game, University of California Davis' Tahoe Environmental Research Center, and University of Nevada, Reno. Since the project began, over 62,000 LCT of catchable size have been stocked in Fallen Leaf Lake, which is a lake that is isolated from Lake Tahoe by a dam. The establishment of a self-sustaining population of LCT has proven elusive due to slow growth and high predation by non-native fishes (Al-Chokhachy et al. 2009). However, continued restocking efforts have established an LCT fishery that is popular with sport fishers. Efforts are ongoing to establish a robust naturally spawning LCT population in Glen Alpine creek and research LCT movements and habitat utilization throughout Emerald Bay, Lake Tahoe, and suitable tributaries (EIP 2019).

LCT have also been reintroduced into the headwaters of the Upper Truckee River, in Meiss Meadows in 1989 and 1990. Since then, efforts have been underway to expand their habitat downstream of Meiss Meadows, including perennial tributaries and mountain lakes within the Upper Truckee Watershed (Moore 2010). LCT were reported present within the Upper Truckee Marsh area adjacent to Lake Tahoe. Field crews from the USFS Lake Tahoe Basin Management Unit surveyed the Upper Truckee River from Lake Tahoe upstream approximately 19.3 kilometers (12 miles) in August and September 2011 as part of the USFS Basin-wide Non-game Fish Assessment. During this survey, two LCT were captured in the river, approximately 1,000 meters (3,280 feet) upstream of the lake. Both fish were missing adipose fins and were determined to be hatchery fish that had been released by the Nevada Department of Wildlife (NDOW) into Lake Tahoe near Cave Rock during the summer of 2011. This is the first time, since extirpation, that Lahontan cutthroat trout had been recorded entering the Upper Truckee River from Lake Tahoe (Lemmers and Santora 2011). Work is ongoing to restore the LCT population in the Upper Truckee River headwaters from Meiss Meadows downstream to the vicinity of Christmas Valley (EIP 2019).

The TRPA Regional Plan addresses the management of fish resources in Lake Tahoe and includes environmental thresholds, goals, and policies for conserving native fisheries in the Basin. The TRPA policies for fisheries include: "(1) consider and mitigate project effects to fish habitat in streams and lakes, (2) prohibit the development of blockages or other impediment to fish movement within streams, (3) develop an in-stream maintenance program to inventory and remove stream barriers, (4) encourage habitat improvement projects in streams and lakes, (5) maintain and enhance in-stream flows, (6) ensure that existing points of water diversion from streams are transferred back to the system whenever feasible, (7) support State and Federal efforts to reintroduce Lahontan cutthroat trout, and (8) control the level of Lake Tahoe to reflect seasonal weather and runoff patterns" (TRPA, 2007).

Within the Lake Tahoe basin LCT potential to occupy six different aquatic habitat types that are also within the Lakewide Aquatic Invasive Plant Control Project Area:

- Lake Tahoe nearshore includes relatively shallow water near the natural Lake Tahoe shoreline. The nearshore includes both rocky and sandy habitats. LCT utilize the nearshore for juvenile rearing, adult feeding, and migration. Nearshore areas in Emerald Bay have been stocked with LCT through recent recovery programs.

- Marinas in Lake Tahoe are artificial embayments created for boats and infrastructure. Aquatic habitat within marinas is highly modified relative to natural lake conditions. Marinas have the highest concentrations of aquatic invasive species in Lake Tahoe. Due to marginal or unsuitable habitat conditions and high predation risk LCT are unlikely to frequent marinas. Juvenile LCT may occupy marginal rearing habitat in marinas but would be at elevated risk for predation while present there.

- Marshes in the Lake Tahoe basin include relatively shallow aquatic habitats at or near lake level with emergent vegetation. Lake Tahoe marshes include or are contiguous with back-beach lagoons and tributaries. Marshes are utilized by LCT primarily for juvenile rearing.

- Lake Tahoe tributaries are utilized by LCT for juvenile rearing, adult feeding, migration, spawning, and egg incubation. Populations of LCT have been restored in the Upper Truckee River, Lake Tahoe's largest tributary, and in Fallen Leaf Lake, which is connected with Taylor Creek.

- The Truckee River below Lake Tahoe may be utilized by LCT for juvenile rearing, adult feeding, migration, spawning, and egg incubation. The Truckee River reaches within the Project Area below Lake Tahoe are not stocked with LCT. However, LCT may occur in these reaches at low densities due to migration from other areas of the watershed where stocking occurs. The Truckee River reaches within the Project Area are characterized by wide flow variation due to spillage from the lake. Reaches immediately below Lake Tahoe may dry when the lake is not spilling and therefore provide only marginal seasonal habitat for LCT.

- Lake Tahoe offshore waters may be utilized by LCT primarily for adult migration. Offshore waters generally do not provide suitable conditions for AIP and will not be directly impacted by AIP treatments. Offshore areas in Emerald Bay may be occupied by LCT that have been stocked through recent recovery programs.

Osprey (*Pandion haliaetus*) The osprey is a TRPA threshold species. They are a migratory species and are present during the breeding season, April 1 through August 15. They build large stick nests in treetops or snags in open forests within fifteen miles of water used for foraging (CDFG 2008). Ospreys are known to nest near the Project Area in Emerald Bay State Park, along multiple locations on the shore of Lake Tahoe. Ospreys have high nest site fidelity and selectively choose nesting locations with a clear view of the surrounding area.

Sierra Nevada mountain beaver (*Aplodontia rufa californica*) The mountain beaver is the only extant member of the family Aplodontidae, and are considered to be the most primitive living rodents. They are stout and compact with small ears and eyes and an inconspicuous tail. Fur color is grey or brown and they are about one foot in length and weigh between 18-32 oz. They have large curved front claws that are used for digging, grasping, and climbing. They are not true beavers but were so named because they gnaw bark in a manner similar to beavers.

This species is found the coastal lowlands and mountains of southern British Columbia south into California, with inland habitat found in montane riparian habitats throughout the Sierra Nevada. The distribution of mountain beaver in Nevada is limited to the vicinity of Lake Tahoe.

There are 2 historical occurrences of mountain beaver on the Nevada side of Lake Tahoe from 1935 and 1977 from the south end of Marlette Lake and an occurrence from 1932 from Third/Incline Creek. In 2001, mountain beavers were captured, tagged, and released in Sugar Pine Point State Park and Burton Creek State Park (McMorrow 2001). In 2001-2004, mountain beavers were more recently captured and released from Tunnel Creek and also the south end of Marlette Lake. Mountain beaver burrows were observed in the vicinity of the Gondola Fire prior to its burning.

Mountain beavers are active throughout the year and are primarily nocturnal. They live in underground burrow systems and are solitary, except during the breeding season. Breeding occurs in spring and females have one litter per year of 2-4 young after a one-month gestation. Mountain beavers seldom travel more than several feet from their burrows which offer protection from predators. Lifespan has been reported as 5-10 years, a relatively long time for a rodent.

Mountain beavers appear to be physiologically limited to moist microenvironments because they have primitive kidneys and must drink about 1/3 of their body weight in water every day. This species digs underground burrow systems where there is deep soil, dense vegetation, and abundant water. Active burrow systems are most evident during the late spring and summer months when most of the digging and repairing is done. Active burrows can be recognized by the presence of newly excavated soil or freshly cut vegetation next to the tunnel entrance, the worn appearance of the tunnel floor, and a lack or scarcity of spiderwebs. Mountain beavers are herbivores and eat a wide variety of plants. Unlike true beavers, they do not build dams, live in lodges, or fell adult trees (though they may girdle trees). Mountain beavers are vulnerable to loss and degradation of riparian habitat due to logging activities, grazing, wildfire, and recreational or urban use.

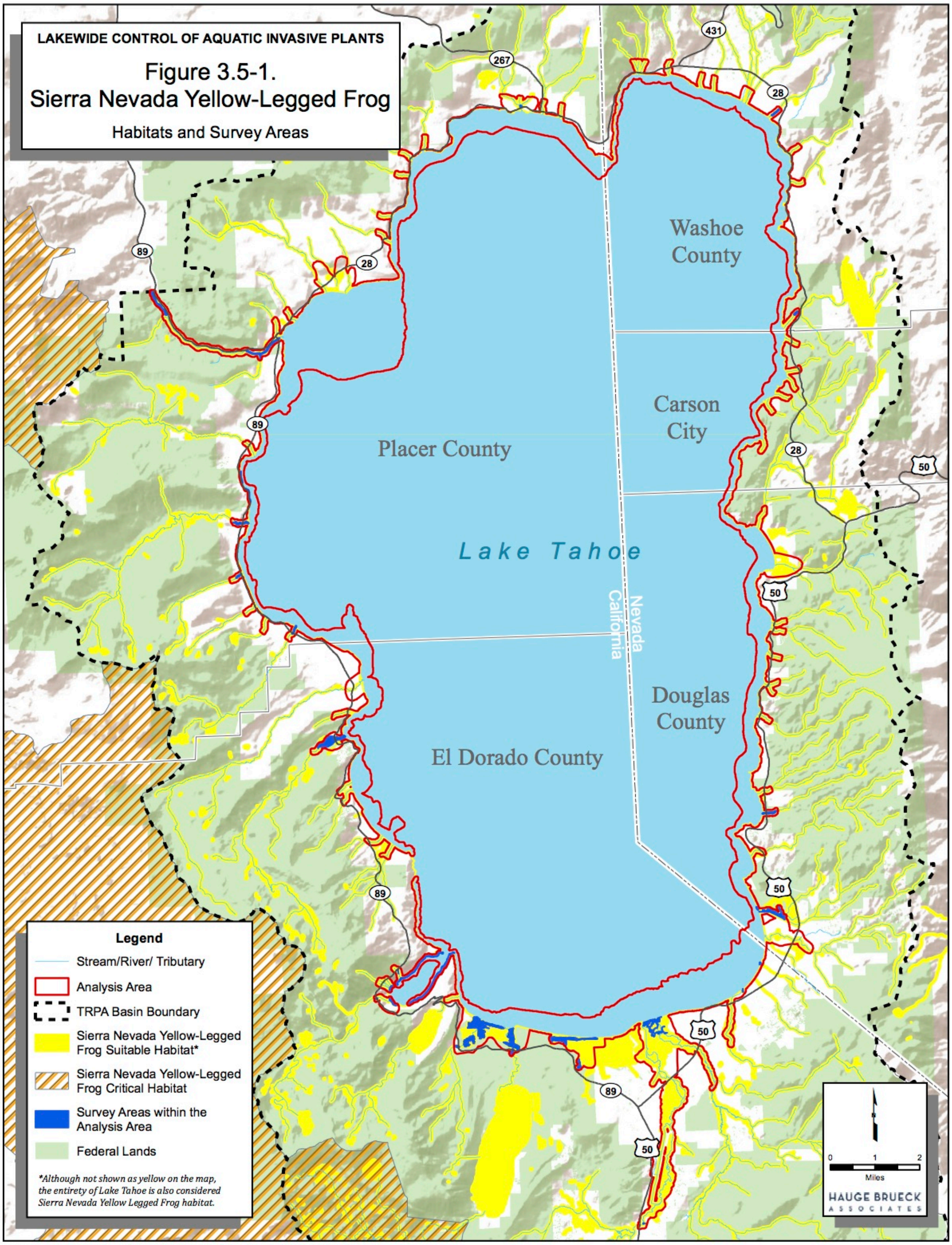
Sierra Nevada yellow-legged frog (*Rana sierrae*) On 29 April 2014, the USFWS designated the Sierra Nevada yellow-legged frog (*Rana sierrae*) as an endangered species under the Endangered Species Act of 1973. 1,831,820 acres across 17 counties in the Sierra Nevada were proposed as critical habitat as a result of the USFWS listing. On August 20, 2014, the USFWS issued a programmatic biological opinion to USFS for the nine national forests within the range of Sierra Nevada yellow-legged frog (SNYLF).

SNYLF inhabits ponds, lakes, and streams associated with montane riparian, lodgepole pine, subalpine conifer, and wet meadow communities (Fellers et al. 2013, Jennings and Hayes 1994). Open stream and lake margins that gently slope to a depth of about 2 to 3 inches are preferred habitat (Matthews and Pope 1999, Jennings and Hayes 1994). In the Sierra Nevada, this species' elevation range extends from approximately 4,500 to 12,000 feet (Stebbins 1985, Jennings and Hayes 1994). Breeding occurs from May to August depending on local conditions (Stebbins 1985). In still water environments, such as pools, eggs are deposited as unattached masses in shallow water; however, in streams the egg masses may be attached to the substrate (Jennings and Hayes 1994). Due to the short active season and the brevity of the intervals during which the aquatic habitat maintains warm temperatures, larvae (tadpoles) may over-winter up to two times before attaining metamorphosis (Mullally and Cunningham 1956, Jennings and Hayes 1994).

The USFWS listed the SNYLF as an endangered species in 2014 due to continued declines across the species range. Population declines in SNYLF are due to multiple factors including introduced predatory fishes, fungal disease, and pollution (Smith et al. 2016, Knapp et al. 2016). SNYLF has disappeared from large areas where the species formerly occurred including most of the Lake Tahoe basin. However, in some areas in Yosemite National Park, populations have begun to rebound due to recent conservation actions (Knapp et al. 2016) indicating a possible path to recovery for the species. Predation by introduced fish is a major threat to SNYLF as evidenced from the species' disappearance from high elevation Sierra Nevada lakes, formerly fishless, after being stocked with trout (Bradford 1991, Bradford 1993). Trout prey upon the early life stages of SNYLF leading to long term population decline. Eradication of trout from high mountain lakes that are occupied or potentially occupied by SNYLF is an effective method of habitat restoration (Knapp et al. 2016). Within the Lake Tahoe basin, SNYLF have been eradicated from most high mountain lakes with introduced fish. As a restoration strategy, USFS has implemented a program to eradicate introduced fish from some high mountain lakes to restore habitat for SNYLF (EIP 2019). Both native and non-native fish occur in Lake Tahoe and adjacent waters encompassed by the Project Area. AIPs provide habitat for introduced warm-water target invasive fishes, such as Largemouth bass (*Micropterus salmoides*) and brown bullhead (*Ameiurus nebulosus*) as well as other introduced SNYLF predators such as American bullfrog (*Lithobates catesbeianus*). Chytrid fungus (*Batrachochytrium dendrobatidis*) is implicated in amphibian declines around the world including declines of SNYLF (Morgan et al. 2007). The introduction and expansion of chytrid in the Sierra Nevada affected SNYLF concurrently with fish introductions to cause declines of SNYLF throughout the Sierra and the extirpation of the species from entire lakes and watersheds where they formerly occurred (Fellars et al. 2007). Bullfrogs are known carriers of chytrid fungus and can spread the disease (Greenspan et al. 2012).

Suitable habitat for SNYLF exists in Lake Tahoe tributaries and marshes within the Project Area (Figure 3.5-1). Recent surveys indicate the species is currently restricted to high elevation lakes and headwaters outside of the Project Area.

Figure 3.5-1. Sierra Nevada Yellow-Legged Frog Habitats and Survey Areas



Sources: US Fish and Wildlife Service; ArcGIS Online shaded relief map service; TRPA. Map date: May 7, 2020.

Table 3.5-3

Recent Known Occurrences of SNYLF and Restored Habitat Available to SNYLF in the Lake Tahoe Basin

Lake Tahoe Basin SNYLF Sites	Elevation	Area	Approximate Distance to Project Area (miles)	Occurrence Status
Cagwin Lake, Cagwin Pond	7765	Desolation Wilderness	6.3	Confirmed Present
Hellhole meadow	8260	Trout Creek	5.0	Confirmed Present
Lake Lucille	8163	Desolation Wilderness	5.3	Restored habitat, potential to colonize
Margery Lake	8225	Desolation Wilderness	5.5	Restored habitat, potential to colonize
Ralston Lake	7802	Desolation Wilderness	6.4	Restored habitat, potential to colonize
Tamarack Lake	7845	Desolation Wilderness	6.0	Restored habitat, potential to colonize
LeConte Lake	8144	Desolation Wilderness	5.4	Restored habitat, potential to colonize
Jabu Lake	8469	Desolation Wilderness	5.3	Restored habitat, potential to colonize

HBA 2019

SNYLF was a historically abundant species throughout the Sierra Nevada although quantitative historical abundance data is not available. Declines in the species were first recorded in the 1970's (Bradford 1991). These declines led the USFS to designate the species as 'sensitive' in 1998 and the USFWS to list the species as endangered in 2014. In the vicinity of Lake Tahoe, the species has disappeared from much of its former range and persisted primarily within the Desolation Wilderness. Most SNYLF populations in the Desolation Wilderness have been documented in high mountain lakes near the Sierra crest that form the headwaters to the American River (USFS 2007, Gross 2014). Critical habitat for SNYLF has been proposed for much of the Desolation Wilderness area including both the Lake Tahoe and American River basins (USFWS 2013). Within the Desolation Wilderness, one verified SNYLF locality was identified within the Lake Tahoe Basin in Cagwin Pond adjacent to Cagwin Lake. Another SNYLF locality within the Lake Tahoe Basin but outside the Desolation Wilderness was identified in Hellhole meadow at the headwaters of Trout Creek. In 2008, USFS LTBMU began an 18 year SNYLF habitat restoration project with the goal of restoring habitat for the species within the Lake Tahoe Basin near existing populations in the Desolation Wilderness (EIP 2019, Gross 2014).

The project area contains a mixture of suitable and unsuitable habitat as shown in Figure 3.5-1. Aquatic habitat occupied or potentially occupied by SNYLF falls into seven general categories:

- Lake Tahoe nearshore includes relatively shallow water near the natural Lake Tahoe shoreline. The nearshore includes both rocky and sandy habitats. SNYLF do not currently utilize the Lake Tahoe shoreline or nearshore as habitat and are unlikely to occur there due to the presence of non-native trout, high human use and high predation.

- Marinas in Lake Tahoe are artificial embayments created for boats and infrastructure. Aquatic habitat within marinas is highly modified relative to natural lake conditions. Marinas have the highest concentrations of aquatic invasive species in Lake Tahoe. Due to marginal or unsuitable habitat conditions, high human use, unsuitable depths, and high predation risk, SNYLF are unlikely to occur in marinas.

- Marshes in the Lake Tahoe basin include relatively shallow aquatic habitats at or near lake level with emergent vegetation. Lake Tahoe marshes include or are contiguous with back-beach lagoons and tributaries. Marshes provide suitable habitat conditions for SNYLF but also high predation risk from native and non-native predators. All marshes within the Project Area are five miles or more from existing SNYLF populations.

- Lake Tahoe tributaries contain suitable habitat for SNYLF, and upper headwaters of some tributaries, such as Trout Creek, harbor existing populations. The Project Area is limited to only the lower reaches of Lake Tahoe tributaries below 6,253 feet in elevations. No SNYLF occurrences have been recorded from these lower tributary reaches in recent years and no existing populations of SNYLF are known to occupy these reaches at this time. Tributary reaches below 6,253 feet in elevation provide large areas of suitable habitat conditions although they tend to harbor fish and other SNYLF predators. The presence of these species would most likely preclude a population getting established without additional actions that are outside the scope of this project (e.g. fish removal).

- The Truckee River below Lake Tahoe contains marginal habitat that is unlikely to be occupied by SNYLF due to predatory fish, variable habitat conditions, and distance from existing SNYLF populations. Critical Habitat is located approximately one mile from this portion of the Project Area.

Western bumble bee (*Bombus occidentalis*) The western bumble bee (*Bombus occidentalis*) is a Forest Service Sensitive (FSS) and candidate endangered in California. There are 94 collection records for the western bumble bee on 11 national forests in Region 5, including seven on the LTBMU (Hatfield 2012). There is only one record of the western bumble bee on the LTBMU since 2000.

Historically, the western bumble bee was one of the most broadly distributed bumble bee species in North America (Cameron et al. 2011). The species was broadly distributed across western North America along the Pacific Coast and westward from Alaska to the Colorado Rocky Mountains (Thorp and Shepard 2005, Koch et al. 2012). Currently, the western bumble bee currently occurs in all states adjacent to California but is experiencing severe declines in distribution and abundance due to a variety of factors including diseases and loss of genetic diversity (Tommasi et al. 2004, Cameron et al. 2011, Koch et al. 2012).

The overall status of populations in the west is largely dependent on geographic region: populations west of the Cascade and Sierra Nevada mountains are experiencing dire circumstances with steeply declining numbers, while those to the east of this dividing line are more secure with relatively unchanged population sizes. The reasons for these differences are not known.

Bumble bees are threatened by many kinds of habitat alterations that may fragment or reduce the availability of flowers that produce the nectar and pollen they require, and decrease the number of abandoned rodent burrows that provide nest and hibernation sites for queens. Major threats that alter landscapes and habitat required by bumble bees include agricultural and urban development. Exposure to organophosphate, carbamate, pyrethroid and particularly neonicotinoid insecticides has recently been identified as a major contributor to the decline of many pollinating bees, including honey bees and bumble bees (Henry et al. 2012, Hopwood et al. 2012). In the absence of fire, native conifers encroach upon meadows and this can also decrease foraging and nesting habitat available for bumble bees. The status of the western bumble bee in the Project Area is unknown. However, the Project Area includes multiple habitats that would contain flowering plants. There are several documented occurrences within the Project Area from the early 20th century, but no recent occurrences are known.

Willow Flycatcher (*Empidonmax traillii*). The willow flycatcher (*Empidonax trailii*) is a Forest Service Sensitive species on the LTBMU and a California state endangered species.

Suitable habitat (i.e. the combination of resources and environmental conditions required to survive and reproduce) for this species in the Sierra Nevada is defined by site elevation, shrub coverage, foliar density, wetness, and meadow size (summarized in Green et al. 2003). Known willow flycatcher sites range in elevation from 1,200 to 9,500 feet, though most (88%, 119 of 135) are located between 4,000 and 8,000 feet (Stefani et al. 2001). Willow flycatchers are closely associated with meadows that have high water tables in the late spring and early summer, and abundant shrubby, deciduous vegetation (especially Salix spp.). Shrubs in these preferred habitats are 6.5 to 13 feet in height, with the lower half comprised of dense woody stems. Live foliage density within the shrub layer is moderate to high and uniform from the ground to the shrub canopy (summarized in USDA 2001). Sites are "significantly more likely to support multiple willow flycatchers, and result in successful breeding efforts, as riparian shrub cover in meadows and willow flycatcher territories increases" (Bombay 1999 as cited in USDA 2001).

In the LTBMU, the breeding season generally occurs from late May or early June, when breeding birds arrive and establish territories, until the fledgling dependency periods ends in the middle of September. This species nests from June 1 to August 31 and fledges young between July 15 and August 31. Fledglings remain in territories for 2-3 weeks after fledging (USDA 2004). However, these dates vary due to factors such as when willow flycatchers arrive on the breeding grounds, snow pack, late spring and summer weather, nest predation, and brown-headed cowbird parasitism (Green et al. 2003).

Livestock grazing, predation, and human activity have all been considered threats to flycatcher nesting habitat. Grazing has been essentially eliminated in the LTBMU, assisting in the restoration of primary habitat for the species. Nest predation is the leading cause of nest failure in willow flycatcher nests in the LTBMU (Mathewson et al. 2011). Human activity (presence of people, dogs, and vehicles) has also been found to be a significant impact to land birds, surpassing that of habitat loss from development (Schlesinger et al. 2008).

In the past three decades, willow flycatchers have undergone substantial population declines in California. In the LTBMU, the flycatcher population has declined from 1997-2010 (Mathewson et al. 2011) and there is some level of uncertainty about the ability of the local population to rebound (Mathewson et al. 2012). Multiple factors likely contributed to the decline including poor quality of meadow habitat, shortened breeding-season length and stochastic weather events, the initial small population size, and low reproduction that influenced dispersal dynamics (Mathewson et al. 2011). Nest predation was the primary cause of nest failure at their study sites. Mathewson et al. (2011) suggest that populations in the LTBMU would approach stable (λ=1) with increased reproductive success. The authors recommend two types of restoration, including: (1) restore meadows currently occupied by willow flycatchers and (2) restore meadows within 5 miles of occupied sites to provide habitat for dispersing flycatchers. Mathewson et al. (2011) suggest that restoration could enhance nest success and recommend increasing riparian shrub cover (e.g., willow) and improving meadow wetness to both increase vegetation and reduce predation rates on nests, fledglings, and adults.

The CWHR model describes high to moderate capability habitats in the montane riparian vegetation type (high = all strata except 1 and 2S; moderate = 2M, 3M, 2P) and wet meadow (all strata) vegetation types for this species. However, as the CWHR model is not subspecies-specific and the local subspecies, *E. t. adastus*, is known to nest only in wet meadows in the LTBMU, high and moderate capability habitat will include the wet meadow vegetation type (all strata) and montane riparian (all strata except 1 and 2S). Habitat types and strata identified above, but located within TRPA Residential, Commercial, or Tourist Accommodation Plan Area Statement land use zones (i.e. areas of high anthropogenic disturbance) do not provide suitable habitat for willow flycatcher.

In the Project Area, nesting, foraging, and perching habitat coincide. There are 262 acres of moderate and high-quality habitat in the analysis area. Tallac Creek, Taylor Creek, Meeks Creek, and Upper Truckee River suitable habitat areas are located within the project boundary. Willow flycatcher have been observed in all these sites in the past.

Yellow warbler (*Dendroica petechia*) The California yellow warbler (*Dendroica petechia brewsteri*) is designated by the California Department of Fish and Wildlife as a species of special concern. Although once common in riparian communities throughout California, it is now an uncommon to rare breeding bird in many lowland areas (Zeiner et al. 1990a). The number of breeding pairs in lowland areas, such as the Colorado River, southern coast, and San Joaquin and Sacramento Valleys, has experienced a dramatic decline in recent decades (Zeiner et al. 1990a).

Breeding occurs in willow dominated riparian communities that may also include cottonwoods, alders, aspens, and sycamores from sea level to 8,000 feet. In the Sierra Nevada, montane chaparral and montane shrubbery in open coniferous forests may also be used for breeding (Dunn and Garrett 1997, Zeiner et al. 1990a). California yellow warblers arrive at their breeding grounds by early May and depart for their wintering grounds by early September (Dunn and Garrett 1997).

Declines of this species have largely been attributed to the loss or alteration of lowland riparian habitats and brood parasitism by brown-headed cowbirds (Dunn and Garrett 1997, Zeiner et al. 1990a).

Montane riparian scrub along the banks of the Upper and Lower Truckee Rivers and other tributaries to Lake Tahoe may provide suitable breeding habitat for this species in the Project Area.

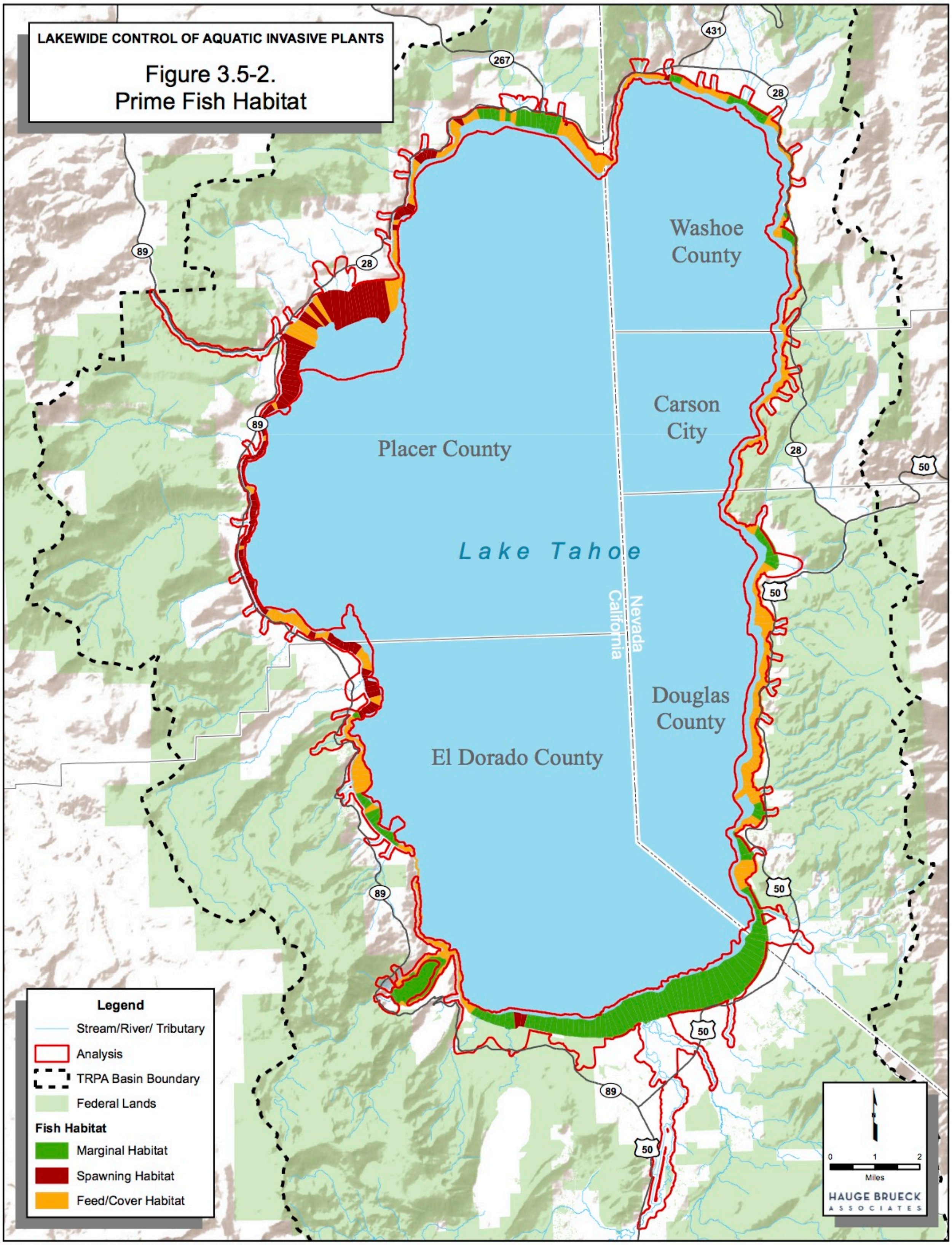
Common Biological Communities

Lake Tahoe supports a variety of aquatic biological communities. The lake fishery includes brook trout, kokanee salmon, rainbow trout, mackinaw, brown trout, Lahontan cutthroat trout, and mountain whitefish, the last two are the only native species. Nongame fish species include Tahoe sucker, Lahontan redside, Lahontan speckled dace, Piute sculpin, and Tui chub. Lake Tahoe is limited in its fishery production as it has low primary production. Existing low levels of nutrients limits its primary productivity. Fish productivity is also limited due to relative low levels of suitable feeding, cover and spawning habitats. Historical impacts to lake habitats during the Comstock era and urban development have further impacted suitable fish habitats in Lake Tahoe (TRPA 1991).

The Lake Tahoe Region fishery is sensitive to habitat disturbance. The maintenance of the fishery has focused on preserving fish habitat in regional lakes and streams. To survive, fish must have favorable water quality, an adequate food supply, and suitable feeding, cover, spawning, and juvenile rearing habitats. Comstock era logging and urban development have negatively impacted lake and stream habitats in the Tahoe Region. The loss of vegetation cover, in-stream flow manipulations, siltation, deterioration of streambed features, and barriers to migration, have negatively impacted fish populations and habitat (TRPA 1991).

General aquatic habitats at Lake Tahoe were identified by Phillips et al. (1978) and included fish spawning areas, inlets to spawning streams, and wetlands. Phillips, et al. (1978) defined prime fish and aquatic habitats as areas that satisfy habitat requirements critical to the survival of fish, or as important components of the Lake's aquatic food chain. These areas had nearshore substrates consisting of rock, boulders, and/or rubble. These areas provided cover, forage, and nursery grounds for a wide variety of organisms, including periphyton, zooplankton, benthic macroinvertebrates (BMI), snails, clams, crayfish, and fish (TRPA 2004). TRPA currently classifies and maps nearshore fish habitat in Lake Tahoe based on this "Prime Fish Habitat" framework (Figure 3.5-2). Whitman et al. (2012) showed that BMI abundances were reduced as a result of barrier placement for Asian clam (*Corbicula fluminea*) removal, and recolonization rates were variable in relation to individual taxon. However, past treatment areas in the Tahoe Keys have shown no apparent effects of synthetic barrier placement and removal on benthic invertebrate densities (Tahoe RCD 2013; Tahoe RCD 2012).

Figure 3.5-2. Prime Fish Habitat



Sources: TRPA; ArcGIS Online shaded relief map service; TRPA. Map date: May 1, 2020.

Sensitive Natural Plant Communities

Sensitive plant communities are regionally uncommon or unique, unusually diverse, or of special concern to local, state, and federal agencies. Removal or substantial degradation of these plant communities constitutes a significant adverse impact under CEQA. A search of the CNDDB did not show any sensitive natural plant communities near the Project Area (CNDDB 2019), but the deep water plant communities in Lake Tahoe are of concern because they are important ecological components in Lake Tahoe and have experienced substantial long-term declines. These plant communities consist of mosses, liverworts, stoneworts, and algae and are found at depths greater than 200 feet. Control activities will occur in waters generally less than 30 feet deep. Project activities are not expected to impact deep-water plant communities.

Wetlands and Waters of the United States

The Federal CWA defines wetlands as lands that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. The USACE has jurisdictional authority of wetlands under provisions found in Section 404 of the CWA. USACE jurisdictional wetlands meet three criteria: hydrophytic vegetation; hydric soils; and wetland hydrology.

Waters of the U.S. (Other Waters) are regulated by the USACE under Sections 401 and 404 of the CWA. They are defined as waters used in interstate or foreign commerce, waters subject to the ebb and flow of the tide, interstate waters including interstate wetlands and other waters such as: intrastate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, and natural ponds. Waters of the U.S. are under the USACE jurisdiction. There are a number of jurisdictional wetlands and waters within the project area as all waters associated with Lake Tahoe and its tributaries where work will be performed are under USACE jurisdiction.

TRPA Goals and Policy, Chapter IV: Conservation Element, Vegetation Goal #2 is to "Provide for maintenance and restoration of such unique ecosystems as wetlands, meadows, and other riparian vegetation." TRPA's goals and policies are implemented by TRPA and the Lahontan by special designation for wetlands and other waters known as Stream Environment Zones (SEZs). SEZs have additional protective regulations.

3.5.2 Environmental Impacts of the No Action Alternative

The No Action alternative would result in the continued growth and spread of invasive aquatic plant species. The prolific growth and expansion of these invasive populations would lead to habitat disruption and loss of native plant and animal communities. These aquatic invasive species often outcompete native plant species and modify the environment to allow for favorable conditions to allow for establishment of other invasive species of plant and animal. This modification can result in a loss in natural species diversity and overall health of local lentic and lotic ecosystems. The No Action alternative would alter the macrophyte community, and the continued spread of AIP may result in changes to nearshore benthic habitats and the associated BMI community composition. AIP spread into nearshore areas could also degrade important habitat for Tui Chub and habitat for important game fish, and if AIP spreads to the mouth of the Upper Truckee River, it could physically block LCT access and/or increase predation.

3.5.3 Environmental Impacts of the Proposed Action Alternative

Table 3.5-4: Biological Resources				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.5-1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? (CEQA IVa)		X		
3.5-2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service? (CEQA IVb)			X	
3.5-3. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? (CEQA IVc)			X	
3.5-4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? (CEQA IVd)			X	
3.5-5. Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance? (CEQA IVe)				X
3.5-6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or				X

state habitat conservation plan? (CEQA IVf)				
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.5-7. Removal of native vegetation in excess of the area utilized for the actual development permitted by the land capability/IPES system? (TRPA 4a)				**X**
3.5-8. Removal of riparian vegetation or other vegetation associated with critical wildlife habitat, either through direct removal or indirect lowering of the groundwater table? (TRPA 4b)				**X**
3.5-9. Introduction of new vegetation that will require excessive fertilizer or water, or will provide a barrier to the normal replenishment of existing species? (TRPA 4c)				**X**
3.5-10. Change in the diversity or distribution of species, or number of any species of plants (including trees, shrubs, grass, crops, micro flora and aquatic plants)? (TRPA 4d)				**X**
3.5-11. Reduction of the numbers of any unique, rare or endangered species of plants? (TRPA 4e)				**X**
3.5-12. Removal of streambank and/or backshore vegetation, including woody vegetation such as willows? (TRPA 4f)				**X**
3.5-13. Removal of any native live, dead or dying trees 30 inches or greater in diameter at breast height (dbh) within TRPA's Conservation or Recreation land use classifications? (TRPA 4g)				**X**
3.5-14. A change in the natural functioning of an old growth ecosystem? (TRPA 4h)				**X**
3.5-15. Change in the diversity or distribution of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects, mammals, amphibians or microfauna)? (TRPA 5a)				**X**

3.5-16. Reduction of the number of any unique, rare or endangered species of animals? (TRPA 5b)		X		
3.5-17. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals? (TRPA 5c)				X
3.5-18. Deterioration of existing fish or wildlife habitat quantity or quality? (TRPA 5d)				X

Discussion

3.5-1. Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? (CEQA IVa)

Plant Species:

Less than Significant with Mitigation Measures. Table 3.5-1 identifies a total of 21 sensitive plant species that have the potential to occur within the project area and or in habitats immediately adjacent to the project site. Specifically, riparian habitats, meadow areas, marsh and wetland habitats that are immediately adjacent to proposed control activities could contain the following species: *Botrychium ascendens, Botrychium crenulatum, Botrychium lineare, Botrychium lunaria, Botrychium minganense, Botrychium montanum, Brasenia schreberi, Bruchia bolanderi, Carex davyi, Carex limosa, Glyceria grandis, Helodium blandowii, Meesia triquetra, Meesia uliginosa, Phacelia stebbinsii, Potamogeton epihydrus, Rhamnus alnifolia,* and *Stuckenia filiformis ssp. alpine.* Although these species vary in their ecological requirements and life history characteristics, they are all restricted to wet habitats (the mosses are further restricted to fens) and the effects of proposed activities to their suitable habitat are expected to be similar.

The proposed action has the potential to result in the direct removal of the above species during project implementation. Sensitive plant species in wet habitats may be removed directly through hand pulling, diver-assisted suction dredging, hydraulic suction dredging, mechanical dredging, UVC, LFA and installation of benthic barriers to eradicate invasive aquatic plants. Surveys for the above species have not been performed in the whole of the project area. **MITIGATION MEASURE BIO-1** requires pre-implementation surveys of project area tributaries, marshes, and nearshore areas of Lake Tahoe to determine the presence/absence of these species prior to commencement of project activities. As noted in **MITIGATION MEASURE BIO-1** if sensitive species are determined to be present in the project area during pre-implementation surveys, measures shall be taken to protect and preserve the individuals and surrounding habitat. RPMs are included to limit disturbance and protect peat-bearing soils, so fen habitat will not be affected and therefore, the sensitive moss species will have additional protection.

The project will result in increased suitable habitat for these species through the removal of aquatic invasive plant species, thereby reducing competition. Natural hydrologic function will be restored to many of the tributaries through the removal of the invasive plant species, thereby increasing suitable habitat for native species and vegetation communities.

The Project will not negatively affect the following species: *Botrychium ascendens, Botrychium crenulatum, Botrychium lineare, Botrychium lunaria, Botrychium minganense, Botrychium montanum, Brasenia schreberi,* *Bruchia bolanderi, Carex davyi, Carex limosa, Glyceria grandis, Helodium blandowii, Meesia triquetra, Meesia uliginosa, Phacelia stebbinsii, Potamogeton epihydrus, Rhamnus alnifolia, and Stuckenia filiformis ssp. alpine.*

Implementation of the proposed action is not expected to have any direct effects on *Dendrocollybia racemosa. Dendrocollybia racemosa* occurs in late seral forests and not within habitat that is to be impacted as a result of project implementation. The proposed project requires that RPMs be performed prior to project implementation that requires a pre-construction survey of the Project Area for the presence of sensitive plant species. All threatened, endangered, proposed, candidate, and sensitive (TEPCS) plant species that are determined to be present or areas known to contain suitable habitat for said species must be avoided and protected as noted in **MITIGATION MEASURE BIO-1**. Due to the location of Project actions and implementation of the RPMs, no direct impacts to *Dendrocollybia racemosa* will occur as all individuals and occupied habitat will be avoided.

Implementation of the proposed action has the potential to have direct impacts on known and unknown occurrences of Tahoe yellow cress. Disturbance to the backshore areas and beaches has the potential to result in indirect impacts to Tahoe yellow cress as a result of project implementation. Staging areas that may occur along the shores of Lake Tahoe have the potential to impact Tahoe yellow cress. Many of the locations where staging could potentially be placed in backshore areas are located in high-use recreation sites (i.e. Zephyr Cove, Baldwin Beach, Pope Beach). See the Biological Evaluation for detailed location information. The areas of known occurrences in the high-use recreation sites are for the majority fenced and protected. Movement of equipment and access to the lakeward portion of the project area by personnel may result in unavoidable plant mortality if the project area is not surveyed prior to project implementation. The proposed project requires that RPMs (included here as **MITIGATION MEASURE BIO-1** below) be performed prior to project implementation that requires a pre-implementation survey of the project area for the presence of sensitive plant species. All TEPCS plant species that are determined to be present or areas known to contain suitable habitat for said species should be avoided and protected as noted in the RPMs outlined in Section 3 above. Due to implementation of the RPMs and **MITIGATION MEASURE BIO-1** no direct impacts to Tahoe yellow cress will occur as all individuals and occupied habitat will be avoided.

Fish and Wildlife Species:

<u>Lahontan Cutthroat Trout</u> - The Project will implement the manual removal of aquatic invasive plant species. Proliferation of these aquatic invasive species often results in the deterioration of natural habitats that support native aquatic species. The removal methods proposed, benthic bottom barriers, mechanical and suction dredging, diver-assisted suction removal, LFA, UVC light treatment, and hand removal, could result in different potential impacts to sensitive fish species and their associated habitats (i.e. LCT). All methods could disturb and modify the behavior of fish although harm to fish is unlikely in most treatment situations. Mechanical dredging, suction dredging, and diver-assisted suction removal have the potential to harm individual fish; however, RPMs/mitigation measures by trained personnel will ensure the potential for harm to fish is low. The presence of aquatic invasive macrophytes degrades habitat for cold-water fish species and in Lake Tahoe has been linked to the increased abundance and distribution of warm-water target invasive fish. The presence of warm-water target invasive fish species in Lake Tahoe poses a significant threat to native fisheries and to the potential recovery of LCT. The presence of AIP increases habitat for implemented warm-water target invasive fish by increasing water temperature, modifying substrate, and increasing reproductive habitat. Therefore, removal and control of AIP throughout Lake Tahoe's nearshore environment will have a beneficial effect on habitat for LCT and will reduce existing threats to LCT recovery.

The potential exists for LCT to be present in the Project Area during placement of the benthic barriers, UVC light operations, and also during mechanical/suction dredging or diver assisted suction removal/hand removal of AIP species. However, AIP infested areas represent poor habitat for LCT therefore density in AIP infested areas is likely to be low. LCT occurring near project activities are likely to avoid the noise and water turbulence resulting from the activity. The AIP treatment method that produces the least amount of noise and water turbulences is UVC light.

The UVC light vessel is equipped with acoustic, strobe light, and bubble curtain fish deterrent systems to repel any fish that may stray too close to the light treatment array (Tahoe RCD 2019).

Treatment crews will follow **MITIGATION MEASURE BIO-4** to prevent adverse impacts to LCT and other native fish. Crews will minimize fish harassment and exercise caution when conducting treatments near LCT recovery or re-introduction project sites. Crews must follow all other RPMs/mitigation measures to minimize adverse impacts to occupied habitats. LFA systems and silt curtains have the potential to modify fish movements, but would not be installed in locations that would block fish migration corridors such as tributary mouths and confluences.

Sierra Nevada Yellow-Legged Frog - Locations where SNYLF are currently known to occur, including high elevation mountain lakes and headwaters, are outside the proposed action area. The proposed action area encompasses some suitable habitat for SNYLF as shown in Figure 3.5-1, but these areas are not known to be occupied by the species. The action area does not encompass SNYLF critical habitat. The closest designated Critical Habitat is more than one mile from the project area boundary near the Truckee River. Furthermore, protocol-level surveys in suitable habitat within and adjacent to the project area will be conducted prior to treatment actions to detect new occurrences of SNYLF and prevent impacts to SNYLF individuals (see **MITIGATION MEASURE BIO-3** below).

Lahontan Lake Tui Chub - The project may affect, but is not likely to adversely affect Lahontan lake tui chub. Eggs attached to aquatic vegetation may be killed by all removal methods. Juveniles inhabiting aquatic vegetation and adjacent substrates may suffer minor incidental mortality from diver-assisted suction dredging, hydraulic dredging, and mechanical dredging. The potential adverse impacts are interpreted to be temporary, insignificant, and discountable. Lahontan lake tui chub will benefit from reduction of habitat for non-native predators. RPMs (**MITIGATION MEASURE BIO-4**) and best management practices designed to prevent adverse impacts to tui chub individuals and spawning populations will be implemented as part of the project.

Great Basin Ramshorn Snail - The project may affect individuals but project actions within the limited geographic extent of USFS waters are not likely to adversely affect Great Basin ramshorn snail at a population level. There is very little existing information on the occurrence of Great Basin ramshorn snail in Lake Tahoe. There is no existing information on the distribution of the species within Lake Tahoe and its tributaries. However, there are currently no data indicating AIP treatments could cause measurable population impacts to Great Basin ramshorn snail within USFS waters. Cumulative impacts on this species over the entire project area are unknown. Under **MITIGATION MEASURE BIO-5**, divers conducting treatments or operating equipment in benthic sediments will avoid incidental injury or mortality to Great Basin ramshorn snail where feasible. Divers will record the presence of Great Basin ramshorn snails when encountered during treatment work and report this information to USFS.

Lake Tahoe Benthic Stonefly - The Lake Tahoe benthic stonefly is unlikely to be impacted by implementation of the proposed control methods due to proposed work being performed to a depth of 30 feet, whereas the Lake Tahoe benthic stonefly occurs at depths greater than 95 feet.

Bald Eagle - The Proposed Action would not affect nesting bald eagles but may disturb foraging and roosting eagles temporarily during project implementation. Currently known bald eagle nests are generally located away from the shore of Lake Tahoe where most project activities would occur. These sites would be considered far enough away from project activities that nesting individuals would not be disturbed. However, if there are project activities that could affect an individual nest, a limited operating period would be implemented to prevent disturbance during the nesting period (**MITIGATION MEASURE BIO-2**). Roosting and foraging bald eagles could be temporarily affected by the project depending on the proximity, duration, and noise level associated with activities. For brief implementation activities (days), the noise from equipment and divers may not exceed baseline levels characteristic of these highly popular recreation areas. Longer duration activities (weeks or months) with consistently loud equipment noise levels and/or many crews could cause bald eagles to temporarily abandon roosting or foraging sites and seek alternative locations. This effect would be limited to the implementation period. In designated bald eagle winter habitat at Taylor Tallac marsh and Pope marsh, operations could be prohibited during the winter period if operations would negatively affect eagles (**MITIGATION MEASURE BIO-2**). Overall, the temporary effects described would be minor. Over time, the project would not influence the quality of nesting habitat but could improve the suitability of foraging habitat. Removing AIP would immediately increase visibility and accessibility of prey species in nearshore foraging habitat. In the long-term, removing invasive weeds could promote habitat use by native fish species that could sustain better quality habitat than non-native fish species.

The Project alternative would result in potential temporary impacts to foraging and roosting eagles due to noise and increased human presence. No other federal action that is unrelated to this project is known that would result in cumulative effects to this species. No cumulative impacts would result.

<u>Willow Flycatcher</u> - The Proposed Action would not affect nesting willow flycatchers but could affect foraging flycatchers during project implementation. Occupied nest sites would be protected from disturbance (**MITIGATION MEASURE BIO-2)**. Presence of equipment and crews during AIP eradication procedures in creek and riparian areas, especially those of long duration (weeks or months), could cause foraging willow flycatcher to temporarily abandon an area. This impact would be temporary and limited project implementation. The Proposed Action would not have any impact on the suitability of willow flycatcher nesting or foraging habitat.

The Project would have minor direct effects and no indirect effects on willow flycatcher and their habitat. There are no cumulative effects expected.

<u>Yellow Warbler</u> - The Proposed Action has the potential to disturb nesting and foraging yellow warbler during project implementation. Presence of equipment and personnel during weed eradication procedures in creek and riparian areas has the ability to disturb yellow warbler as suitable habitat exists in areas adjacent project areas located in wetlands and riparian corridors. Implementation of **MITIGATION MEASURE BIO-2** will result in avoidance of nesting yellow warbler and limit impacts to this species.

The Project would have no minor direct effects and no indirect effects on yellow warbler and their habitat. There are no cumulative effects expected.

<u>Osprey</u> - The Proposed Action may disturb nesting and foraging osprey. Osprey are known to nest in a variety of areas along the shores of Lake Tahoe. The potential exists for impacts to these species due to noise and visual disturbance from project activities. Increased noise and human presence in the control sites during nesting season may have negative impacts on the reproductive success of osprey. Implementation of **MITIGATION MEASURE BIO-2** will reduce potential visual and noise disturbance to a less than significant level for osprey.

Indirect impacts that may result include potential temporary impacts to foraging and roosting osprey due to noise and increased human presence. This impact is expected to be minor and not result in a cumulative impact due to its temporary nature and the existing recreational uses of many AIP control sites. No other action that is unrelated to this project is known that would result in cumulative effects to this species.

<u>Northern Goshawk</u> – The Proposed Action would not affect nesting goshawks because a Limited Operating Period would be implemented in a buffer around a nest during the nesting period (**MITIGATION MEASURE BIO-2**). The Proposed Action would not affect the suitability or amount of goshawk habitat. Goshawks may temporarily avoid foraging sites during operations like hand pulling, benthic barrier installation, and hand suction removal because of the presence of crews and associated noise. This effect would occur only during implementation actions. The other potential control/eradication methods would not affect goshawk because they would not overlap with suitable habitat.

The Project would have temporary effects on northern goshawk. Impacts that may result include potential temporary impacts to foraging and roosting goshawk due to noise and increased human presence. This impact is expected to be minor and not result in a cumulative impact due to its temporary nature and the existing recreational uses of many AIP control sites. No other action that is unrelated to this project is known that would result in cumulative effects to this species.

Western Bumble Bee - The Proposed Action would not affect bumble bee hives, but may temporarily affect foraging individuals and foraging habitat during implementation. Crews accessing sites may disturb foraging individuals and may trample flowering plants that bees pollinate. This effect would be minor and limited to the implementation period.

The Project would have minor direct and no indirect effects on western bumble bee and their habitat and as such there are no cumulative effects expected.

Mountain Beaver - The Proposed Action has the potential to disturb foraging mountain beaver. This species burrows in soils in riparian areas in close proximity to water. Presence of equipment and personnel during weed eradication procedures in creek and riparian areas has the ability to disturb mountain beaver as suitable habitat exists in areas adjacent project areas located in riparian corridors.

The Project would have minor direct and no indirect effects on mountain beaver and their habitat and as such there are no cumulative effects expected.

3.5-2. Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service? (CEQA IVb)

Less than Significant Impact. Project activities would not result in impacts to riparian habitat as activities will take place in aquatic environments and away from shores or stream banks of Lake Tahoe, its tributaries and the Truckee River in the project area. Deep water plant communities are of local concern because they are important to the ecology of Lake Tahoe and because they have experienced substantial documented declines in the lake. The Project is not expected to impact deep water plant communities because the Project Area is contained within 30 feet of water depth. Removal of AIP in the lake and the upper reaches of the Truckee River will result in a long-term benefit for native species in Lake Tahoe and will have a less than significant impact on riparian habitat and sensitive natural communities.

3.5-3. Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? (CEQA IVc)

Less than Significant Impact. Project activities would occur on lake, river and creek substrates of the project area control sites located in Lake Tahoe, its tributaries and the Truckee River. Benthic barriers will be secured to the lake bottom temporarily covering the substrate and any substrate affected by diver-assisted suction removal of non-native plant species would be left in place or returned clean. Hand removal or suction dredging may occur in aquatic environments to eradicate non-native plant species. No long-term negative impacts to wetlands and waters of the US are expected as a result of removal of non-native plant species. Temporary impacts to waters of the US will result through the installation of benthic barriers and associated anchors or hand removal or suction dredging. The benthic barriers, while considered fill, will be removed at the end of the project duration and will not be placed in the control sites in perpetuity. The Project would comply with State and Federal regulatory requirements concerning work in protected waters. The short-term duration of the project, long-term ecological benefits of the proposed activities, and lack of permanent alteration of the substrate would result in less than significant impacts.

3.5-4. Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? (CEQA IVd)

Less than Significant Impact. The Project will not impede fish or wildlife movement and will not impact wildlife corridors. Work will occur in Lake Tahoe its tributaries and the Truckee River all of which contain fish migration corridors. Assessment of specific treatment sites, timing, and practices by treatment crews will prevent project actions that block fish migration corridors during spawning periods in accordance with **MITIGATION MEASURE BIO-4**. Installation of turbidity curtains surrounding the control sites will not impact the movement of fish species as small working areas will be cordoned off at any one time. This will prevent large areas from becoming excluded from fish movement. The positive impacts of the proposed AIP species removal include increased habitat suitability, decreased predator density, and increased movement opportunities for native fish species. The short-term impacts noted above will result in less than significant impacts to fish and their associated movement. There are no known wildlife nursery sites in the Project Area.

3.5-5. Would the Project conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance? (CEQA IVe)

No Impact. The Project will comply with local policies protecting biological resources. The purpose of the Project is to protect the native aquatic habitats of Lake Tahoe its tributaries and the Truckee River that lie within the Tahoe Basin. The resulting conditions will benefit local native biological resources and will have a beneficial impact on the ecology of the Project Area. Tree removal is not proposed. Therefore, no impacts would occur.

3.5-6. Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? (CEQA IVf)

No Impact. The Project will not conflict with local ordinances, adopted conservation plans, or policies. The resulting conditions will benefit local native biological resources and will have a beneficial impact on the ecology of the Project Area. Therefore, no impacts would occur.

3.5-7. Would the Project result in removal of native vegetation in excess of the area utilized for the actual development permitted by the land capability/IPES system? (TRPA 4a)

No. The project will not result in removal of native vegetation in excess of the area that is utilized. No development is proposed with the project.

3.5-8. Would the Project result in removal of riparian vegetation other vegetation associated with critical wildlife habitat, either through direct removal or indirect lowering of the groundwater table? (TRPA 4b)

No. The project will not result in removal of riparian vegetation associated with critical wildlife habitat. In areas with native riparian vegetation present, such as marshes, the control methods used would be selective based on the conditions and presence of native vegetation, to avoid removal of non-AIP vegetation. For example, control methods such as benthic barriers could be used in marshes if native riparian vegetation is not present in the area of infestation to be treated. Each control site would be evaluated for the appropriateness of the control method that could be applied. No changes to the groundwater table will result from the proposed project.

3.5-9. Would the Project result in introduction of new vegetation that will require excessive fertilizer or water, or will provide a barrier to the normal replenishment of existing species? (TRPA 4c)

No. The project will not result in the introduction of new vegetation that will require excessive fertilizer or water. Temporary benthic barriers will be utilized to control populations of aquatic invasive plant species. These barriers will be removed upon completion of control activities to allow the replenishment of native species.

3.5-10. Would the Project result in change in the diversity or distribution of species, or number of any species of plants (including trees, shrubs, grass, crops, micro flora and aquatic plants)? (TRPA 4d)

No. Through the control of AIP species, the proposed project will result in an overall increase in native plant populations and an overall increase in ecosystem functioning and health.

3.5-11. Would the Project result in reduction of the numbers of any unique, rare or endangered species of plants? (TRPA 4e)

No. Through the control of AIP species, the proposed project will allow for an overall increase in suitable habitat for unique, rare or endangered plant species and will result in an overall increase in ecosystem functioning and health.

3.5-12. Would the Project result in removal of streambank and/or backshore vegetation, including woody vegetation such as willows? (TRPA 4f)

No. The project will not result in the removal of streambank or backshore vegetation. In areas with native streambank or backshore vegetation present, such as marshes, the control methods used would be selective based on the conditions and presence of native vegetation, to avoid removal of non-AIP vegetation. For example, control methods such as benthic barriers could be used in marshes if native riparian vegetation is not present in the area of infestation to be treated. Each control site would be evaluated for the appropriateness of the control method that could be applied.

3.5-13. Would the Project result in removal of any native live, dead or dying trees 30 inches or greater in diameter at breast height (dbh) within TRPA's Conservation or Recreation land use classifications? (TRPA 4g)

No. No tree removal is proposed, and no impact would occur to tree species.

3.5-14. Would the Project result in a change in the natural functioning of an old growth ecosystem? (TRPA 4h)

No. No tree removal is proposed, and no impact would occur to tree species.

3.5-15. Would the Project result in change in the diversity or distribution of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects, mammals, amphibians or microfauna)? (TRPA 5a)

No. The Project is planned to result in the decrease in density and distribution of non-native AIP species. The Project will result in an overall increase in ecosystem function and health. The project would not result in a change in the diversity or distribution of species, or numbers of any species of animals. Incidental impacts to individual animals would not likely result in population-level impacts and would be offset by the beneficial impacts of the project through overall increase in ecosystem function and health.

3.5-16. Would the Project result in reduction of the number of any unique, rare, or endangered species of animals? (TRPA 5b)

No, with Mitigation. The project will not result in the reduction in the number of any unique, rare, or endangered species of animals. See discussion and analysis for Question 3.5-1 above. Implementation of **MITIGATION MEASURES BIO-2** through **BIO-5**, ensure no significant impact would occur.

3.5-17. Would the Project result in introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals? (TRPA 5c)

No. See discussion and analysis for Question 3.5-4 above.

3.5-18. Would the Project result in deterioration of existing fish or wildlife habitat quantity or quality? (TRPA 5d)

No. The project will not result in any deterioration of any existing fish or wildlife habitat. Removal of invasive aquatic plant species will result in an increase in overall ecosystem health as it will allow for the expansion of native plants and habitats.

3.5.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed AIP control methods described in the project description. Biological resource impacts are evaluated in terms of NEPA Intensity Factors 1, 3, 7, 9, and 10.

Issue - Effects to Biological Resources

Direct and Indirect Effects

Direct indirect and cumulative effects to biological resources are outlined and discussed in Sections 3.5-1 and 3.5-3 above for Threatened, Endangered, Candidate, Special Status and Sensitive species. The following is a summary of the determinations that were pulled from the Biological Evaluations prepared for the Project and are available upon request from the Lake Tahoe Basin Management Unit Supervisor's Office:

The proposed action **will not affect** Cui-ui (*Chasmistes cujus*), Pacific fisher (*Martes pennanti*), North American wolverine (*Gulo gulo*), Yosemite toad (*Anaxyrus canorus*), great gray owl (*Strix nebulosi*), California spotted owl *(Strix occidentalis*), Pacific marten (*Martes caurina*), Townsend's big eared bat (*Corynorhinus townsendii*), fringed myotis (*Myotis thysanodes*), and pallid bat (*Antrozous pallidus*).

The proposed action **may affect but is not likely to adversely affect** Sierra Nevada yellow-legged frog (*Rana sierrae*) and **will not affect its critical habitat**. The project **may affect but is not likely to adversely affect** the Lahontan cutthroat trout (*Onchorynchus clarkia henshawi)*.

The proposed action **may affect, but is not likely to adversely affect** western bumble bee (*Bombus occidentalis*), northern goshawk (*Accipiter gentilis*), willow flycatcher (*Empidonax traillii*) and bald eagle (*Haliaeetus leucocephalus*) because direct effects to individuals would be minor and temporary in the form of disturbance to foraging individuals.

For the Lahontan Lake tui chub (*Siphateles bicolor pectinifer*), direct effects to individuals would be minor and temporary in the form of disturbance to foraging individuals, incidental mortality of eggs, and minor incidental mortality of individuals. However, beneficial impacts to the species resulting from removal of habitat for predators would likely mitigate adverse impacts to the tui chub. Therefore, the proposed action **may affect, but is not likely to adversely affect** for Lahontan Lake tui chub**.**

For the Great Basin ramshorn snail (*Helisoma newberryi*) direct effects to individuals from dredging, bottom barriers, and suction removal may result in limited incidental mortality. The potential for incidental mortality within USFS waters would be spatially limited and would be unlikely to cause population level effects. Therefore, the proposed action **may affect, but is not likely to adversely affect** the Great Basin ramshorn snail**.**

The Proposed Action **may affect but is not likely to adversely affect** *Botrychium* spp., Bolander's candle moss (*Bruchia bolanderi*), Blandow's bog moss (*Heliodium blandowii*), or board-nerved hump-moss (*Meesia uliginosa*). This determination is based on the following a) lack of direct effects to individuals; b) lack of indirect negative effects; c) the Proposed Action will result in beneficial indirect effects through increased suitability of habitat for *Botrychium* spp., Bolander's candle moss (*Bruchia bolanderi*), Blandow's bog moss (*Heliodium blandowii*), and board-nerved hump-moss (*Meesia uliginosa*); and d) potential effects can be adequately addressed through the RPMs outlined in Section 3 above.

The Project **may affect, but is not likely to adversely affect** Tahoe yellow cress (*Rorippa subumbellata*). This determination is based on the following: a) direct effects to the species will be avoided and b) potential effects can be adequately addressed through the RPMs outlined in Section 3 of this document.

The Project **will not affect** *Dendrocollybia racemosa.* This determination is based on the following: a) lack of direct effects to individuals; b) lack of indirect effects; and c) potential effects can be adequately addressed through the RPMs outlined in Section 3 of this document.

Cumulative Impacts

The Proposed Action would not result in a cumulative impact to foraging western bumble bees, northern goshawks, and willow flycatcher and foraging and roosting bald eagles due to its temporary nature and the existing recreational uses of many AIP control sites. No other action that is unrelated to this project is known that would result in cumulative effects to these species.

Although restoration and recovery programs for SNYLF in the Lake Tahoe basin may increase the future likelihood of individuals occurring within the analysis area; they would not increase the likelihood of adverse impacts to the species. Regular surveys, resources protection measures, and best management practices would prevent increased risk of adverse impacts due to SNYLF range expansion.

Ongoing recovery and stocking programs for LCT in the Lake Tahoe basin by state and federal agencies may increase the abundance of LCT in the analysis area and increase likelihood of individuals occurring within AIP control areas. However, the success of stocking and recovery programs would not increase the likelihood of adverse impacts to the species. The Tahoe RCD Target Invasive Fish Control Program has the potential to positively impact LCT populations by reducing the presence of non-native invasive fish species within the waters of Lake Tahoe. RPMs, best management practices, and coordination with state and federal fisheries managers would prevent adverse impacts to LCT.

The Tahoe RCD Target Invasive Fish Control Program has the potential to positively impact Lahontan lake tui chub populations by reducing the presence of non-native invasive fish species within the waters of Lake Tahoe. The No Action and Proposed Action alternative would have no measurable population impacts on the Lahontan lake tui chub within LTBMU NFS waters. The cumulative impacts of the Proposed Action throughout the entire analysis area, NFS and non-NFS waters combined, would be greater than the impacts in NFS waters alone. However, treated habitat would remain a small fraction of total habitat within the analysis area so no cumulative population impacts would occur.

The cumulative impacts of the Proposed Action on Great Basin ramshorn snail throughout the entire analysis area NFS and non-NFS waters combined, would be greater than the impacts in NFS waters alone. The cumulative population impact of the Proposed Action throughout the entire analysis area, when compared to the No Action alternative, is unknown.

Overall, the Project results in a beneficial impact for native species. The project will result in increased suitable habitat for sensitive plant species through the removal of aquatic invasive plant species, thereby reducing competition. Natural hydrologic function will be restored to many of the tributaries through the removal of the invasive plant species, thereby increasing suitable habitat for native species and vegetation communities. In addition, removal and control of AIP throughout Lake Tahoe's nearshore environment will have a beneficial effect on lake habitat for LCT and will reduce existing threats to LCT recovery. Lahontan lake tui chub will benefit from reduction of habitat for non-native predators. In the long-term, removing invasive weeds could promote habitat use by native fish species that could sustain better quality habitat than non-native fish species, thereby supporting protected predatory bird species.

3.5.5 Environmental Commitments and Mitigation Measures

The biological resources analysis determines that **MITAGATION MEASURE BIO-1** is necessary to reduce potential impacts to sensitive plant species to a level of less than significant.

Mitigation Measure BIO-1: Sensitive Plant Protection

1. For work to be performed in tributaries, marshes, the near shores of Lake Tahoe, as well as access and staging areas (up to a 50 foot buffer), review of past records and/or pre-implementation surveys shall be performed to determine the presence of sensitive (TEPCS) plant species prior to commencement of AIP control actions. AIP treatment areas, including staging and access locations that include potential habitat, shall be surveyed by a qualified biologist for sensitive plant species during a time when their morphological characteristics are visible. Surveys for AIP treatment sites shall be considered valid for five (5) years from the date of the survey for upland species. If TEPCS plant species are present, the LTBMU, California Department of Fish and Wildlife, Nevada Department of Conservation and Natural Resources and/or TRPA biological staff, as necessary, shall be contacted to specify which resource protection measure shall be implemented, which may include avoidance, exclusion, or time of year limitations to be implemented to eliminate impacts to individuals or occupied habitat. Protection measures may entail installation of protection fencing to allow for establishment of avoidance areas and buffers to protect individuals and habitat. Implementation of the Proposed Action shall not commence without the agreed upon protection measures in place to protect sensitive species.

2. Tahoe yellow cress (TYC) shall be avoided. If treatment work is planned for mid-May or after, TYC surveys shall occur prior to, but in the same growing season as AIP treatment implementation. If treatment work is planned in April or early May, TYC surveys shall be conducted at the end of the prior year growing season. Known occupied sites (established or new detections) of Tahoe yellow cress shall be avoided and protected using fencing so as to not disturb individuals (submerged or terrestrial) and/or surrounding habitat up to 50 feet from project activities. Dredging shall not be performed adjacent to or within known or located TYC sites so as to prevent impacts to individuals. Diver assisted suction removal shall also be limited to areas outside TYC sites to limit impacts to submerged rootstock. Hand pulling is the preferred method for AIP treatments within TYC sites.

3. Disturbance at access and staging areas shall be minimized by using or accessing only the area needed to access the treatment site or store materials used for AIP removal. While areas with TEPCS plants shall be avoided when establishing access routes and staging areas, as discussed in measures 1 and 2 above, the access and staging areas shall be confined to existing disturbed areas, as feasible, where TEPCS plants are

not located, such as parking lots, piers, or other paved or previously disturbed areas. Fencing shall be placed around stored materials in the staging areas to contain the materials and access to the materials. In areas where paved areas, piers, or disturbed trails are not present, staging and access shall be limited to areas of the least disturbance where no TEPCS species are present and outside of TEPCS buffer areas. These areas shall be limited to the minimum staging necessary for the equipment and materials used in AIP removal and access shall be limited and marked to the minimum width and length necessary based on the control method.

4. Specific pre-implementation and post-implementation monitoring evaluations of disturbed areas and success of revegetation in staging areas shall be conducted, if necessary.

The biological resources analysis determines that **MITIGATION MEASURE BIO-2** is necessary to reduce potential impacts to willow flycatcher, osprey, bald eagles, and nesting bird species to a level of less than significant.

Mitigation Measure BIO-2: Terrestrial Wildlife Species Surveys and Limited Operating Periods

1. Limited Operating Periods (LOP) for FSS and TRPA Special Interest Species shall be maintained when it is determined that AIP control actions would occur within nest buffer zones or winter management zones and disturb individuals. The current list of LOPs is in Appendix C of the Wildlife BE. LOPs **<u>shall</u>** ~~may~~ be updated prior to implementation if species lists change or if LOPs for an individual species change independent of this.

2. If project activities are located within a northern goshawk Protected Activity Center (PAC), prior to commencement of project activities, it shall be determined if the PAC is active and/or if nesting is occurring. If the PAC is active (with known current or recent history of nesting activity), a **<u>permitting agency approved</u>** biologist shall determine based on the nature of the specific project activity if a limited operating period shall be required. If the PAC is not considered active the proposed activity shall be allowed to proceed.

3. In suitable habitat and habitat with historic detections of willow flycatchers **<u>(as defined by the permitting agency approved biologist),</u>** conduct surveys for the species the season before or the same season as (but before) proposed project activities. If willow flycatchers are detected during surveys, implement the LOP to protect nesting individuals (see Wildlife BE Appendix C).

4. Nesting bird surveys shall be conducted no more than 30 days prior to project activities if work would occur near nesting features or within suitable habitat **<u>(as defined by the permitting agency approved biologist)</u>** during the breeding season (generally April to August). If a nest is detected and it is determined that the nesting individual would be disturbed by project activities, develop species-specific measures to prevent disturbance. Measures would generally involve a 50-foot disturbance buffer around a nest, which may vary based on the nesting species, or a delay in project activities. Areas within the buffer could be accessed after the birds fledge, typically after August 15.

The biological resources analysis determines that **MITIGATION MEASURE BIO-3** is necessary to reduce potential impacts to Sierra Nevada yellow-legged frog to a level of less than significant.

Mitigation Measure BIO-3: Sierra Nevada Yellow-Legged Frog Surveys and Protection

1. In areas with potential habitat, specifically Lake Tahoe marshes and tributaries as depicted in Figure 3.5-1, one (1) to three (3) protocol surveys for SNYLF shall be conducted at previously un-surveyed AIP control sites prior to the start of AIP control actions. Three surveys will be conducted if previously un-surveyed habitat is determined to be suitable. One survey may be conducted if previously un-surveyed habitat is

determined to be unsuitable during the first survey. As stated in the USFS Programmatic Biological Opinion (FF08ESMF00-2014-F-0557) the surveys will be within the last 10 years, can be staggered during one season from 14 calendar days after the date snowmelt begins through September 15 (early, mid, late season) or conducted over three seasons during separate consecutive years. At least one of the surveys will be conducted during a calendar year where snowpack is 80 percent or greater than normal. Surveys shall begin eight (8) weeks prior to work and finish with a pre-treatment survey within a week of the start of AIP control actions. If SNYLF are detected, Forest Service and USFWS biologist shall be notified and together shall identify the appropriate resource protection measure that shall be implemented to avoid disturbance to SNYLF before starting the treatment, such as biological monitoring during treatment work, spatial adjustment of treatments, adjustments to treatment timing, adjustments to equipment or treatment protocols, and change of treatment method or approach.

2. Personnel conducting AIP control actions shall be trained to identify and be aware of the potential presence of SNYLF and to minimize impacts to the species. If SNYLF are detected, AIP control actions shall temporarily cease and USFS and USFWS biologists shall be notified. Prevention of project impacts through implementation of resource protection measures, such as biological monitoring during treatment work, spatial adjustment of treatments, adjustments to treatment timing, adjustments to equipment or treatment protocols, and change of treatment method or approach, shall be addressed before resuming the treatment.

The biological resources analysis determines that **MITIGATION MEASURE BIO-4** is necessary to reduce potential impacts to Lahontan cutthroat trout or Lahontan lake tui chub to a level of less than significant.

Mitigation Measure BIO-4: Lahontan Cutthroat Trout, Lahontan Lake Tui Chub, and Native Fish Protection

During implementation of AIP control actions, project scientists, technicians, divers, and equipment operators shall avoid disturbance and harm to LCT, Lahontan lake tui chub, and other spawning native fish by following these guidelines:

1. Prior to implementing control methods, control sites shall be monitored to identify presence of fish species to avoid aggregations of breeding native fish. Native fish primarily spawn from April – July in tributaries and areas identified as TRPA designated Prime Fish Habitat (TRPA 2015), and some native fish may spawn on or near aquatic vegetation. Therefore, if pre-implementation monitoring identifies presence of native fish, the area shall be avoided between April and July.

2. **For tributaries with no aggregation of native fish,** avoid blockage of tributary mouths and confluences for multi-day periods during the April-July breeding season. Benthic barriers **and** silt curtains~~, and LFA equipment~~ have the greatest potential to form barriers to migrating fish and their use shall be limited to maintain passage between April to July within tributary mouths and confluences.

3. Minimize fish harassment and exercise caution when conducting treatments near LCT re-introduction sites. Fish harassment can be minimized by monitoring the area for fish activity, avoiding areas with fish presence and moving to another area within the control site, temporarily stopping activity until fish have moved out of the area, and reducing the intensity of removal activity in the area. Divers shall be trained to avoid interaction with fish, shall not pursue or antagonize fish to leave the area, and shall not collect, trap, or harm fish while conducting AIP removal activities.

The biological resources analysis determines that **MITIGATION MEASURE BIO-5** is necessary to reduce potential impacts to Great Basin rams-horn snail to a level of less than significant.

Mitigation Measure BIO-5: Great Basin Rams-Horn Snail Protection

Since Great Basin ramshorn snail is a Forest Service sensitive species, but not state or otherwise federally listed, full avoidance of the species in all areas is not required; however, protection measures are proposed on National Forest System lands. While hand-pulling and diver-assisted suction removal would not injure species individuals, divers conducting treatments or operating equipment in benthic sediments on National Forest System lands shall familiarize themselves with the identification of Great Basin ramshorn snail. If species are detected during implementation activities, specifically diver assisted suction removal, divers will avoid incidental injury or mortality to the species where feasible. This may include inspecting plants prior to removal to ensure the species is not on the AIP to be removed, and where feasible removing the species from AIP prior to suctioning. Divers will record the presence of Great Basin ramshorn snails when encountered during treatment work and report to U.S. Forest Service biologists. If further AIP removal within areas of known presence is needed, the records shall be reviewed with the U.S. Forest Service to identify appropriate protection measures before work is continued based on the location, extent, and methods to be used.

3.6 CULTURAL, ARCHAEOLOGICAL, AND HISTORICAL RESOURCES

3.6.1 Setting

This section discusses the potential Project impacts on cultural resources related to disturbance of archaeological, historical, architectural, and Native American and traditional heritage resources and addresses disturbance of unknown archaeological and paleontological resources (fossils). To provide a basis for this evaluation, the setting subsection describes broad periods of cultural history for the Project Area, which is the Lake Tahoe water body, tributary reaches and adjacent marshlands, and the Lower Truckee River reach from the dam outlet in Tahoe City to River Ranch at Alpine Meadows Road. The goal of the cultural resources analysis for this Project is to identify prehistoric and historic archaeological sites, architectural and historical sites, historical landscapes, and traditional cultural properties, including Native American heritage resources, potentially affected by implementation of the Project. Detailed archaeological and ethnographic settings of the Project Area are found in the cultural resource report (Section 3.2) prepared for the Project Section 2.2, Regulatory Authority, describes narratives regarding CEQA assembly Bill 52, Executive Order W-26-92 and National Historic Preservation Act (NHPA).

Detailed research on the topic of Tahoe Sierra paleoclimate is found in The Lake Tahoe Environmental Improvement Program, Volume 1, Contextual Background: Lake Tahoe Outlet (Lindström et al. 2002), and in The Lake Tahoe Watershed Assessment, Vol. 1, Chapter 2 (Murphy and Knopp 2000).

There are several Native American communities in close proximity to Lake Tahoe. None of these communities are living on, or adjacent to, the Project Area. No treaty rights (hunting, fishing, etc.) are associated with any of these communities or with the Project Area. Some members of these communities, hunt and some do subsistence collecting of materials such as basket weaving materials and medicinal plants on public lands. However, this is general use and no specific "traditional use areas" have been identified by any of the tribes at this time. Any other traditional uses or use areas have not been divulged towards preparation of this environmental document. The Project Area has not been identified as a Native American religious or sacred site.

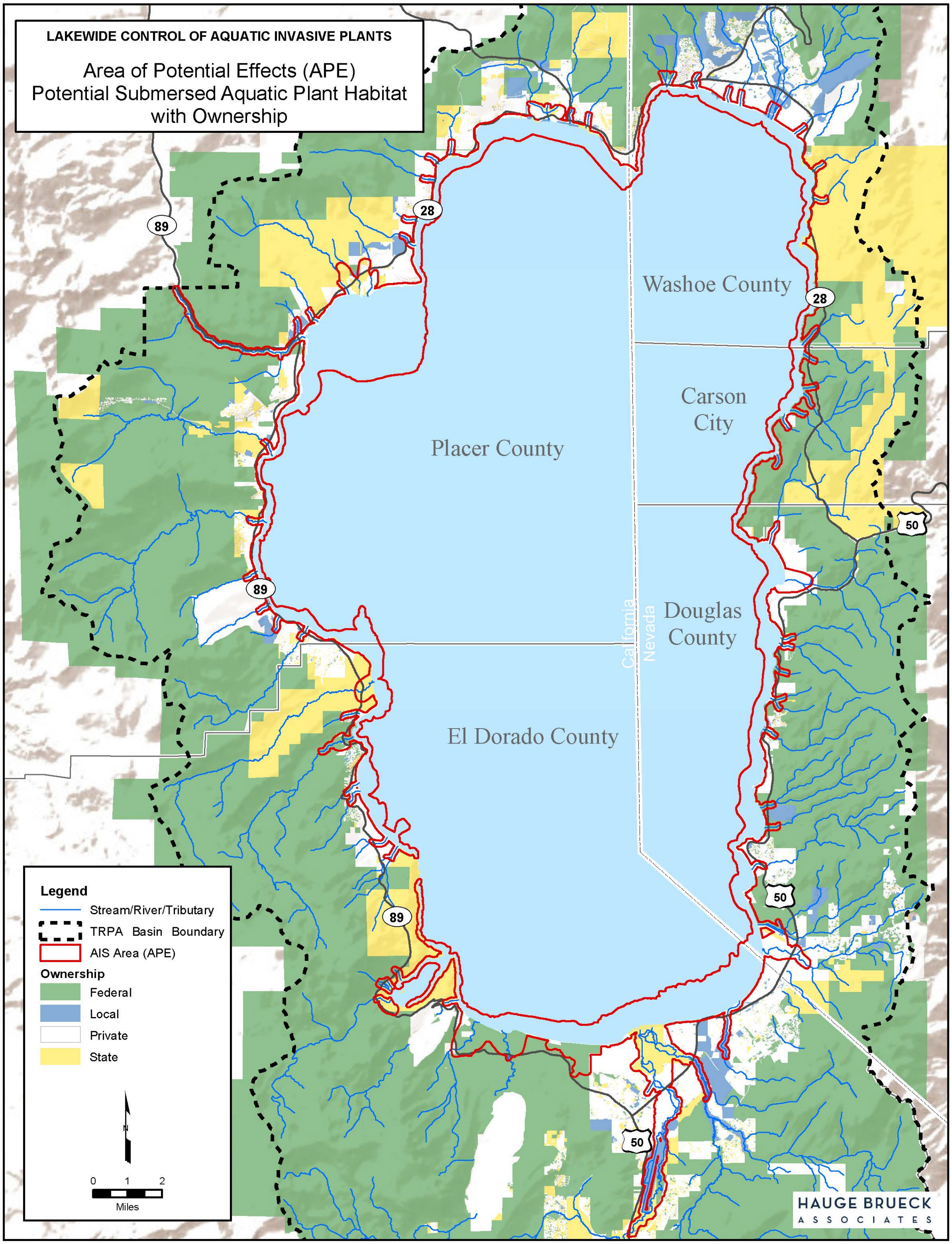
A full accounting of known cultural resources within the Project Area of Potential Effects (APE) was achieved through a comprehensive literature review and records search of regional, federal, and state agency archives. The APE is defined as areas around the shoreline from the lake's natural rim (6223 feet elevation contour) to a depth of 36-foot (11 meters) below present water level (6220 feet elevation), tributaries and marshlands, and the Lower Truckee River reach from the dam outlet of Lake Tahoe in Tahoe City, CA to River Ranch at Alpine Meadows Road (Figure 3.6-1).

In 2014, Denise Jaffke, Associate State Archaeologist with California State Park, conducted a records search of 1) the Sierra District Unit Data Files located at the Cultural Resources Office, Ed Z'berg Sugar Pine Point State Park, 2) CTC cultural resource files, and 3) Heritage Resource files located at LTBMU. Information collected in the course of research was supplemented with pertinent archaeological resource information compiled by Susan Lindström, a resident archaeologist with substantial experience in the Project Area. This archaeological resource information was compiled into a single Excel spreadsheet and georeferenced using ArcMap 10. Record searches undertaken for this Project had two primary purposes: to determine whether known archaeological or historic resources are located within the study area; and to determine the likelihood of unrecorded resources based on the distribution and characteristics of known submerged sites. This information was then used to identify archaeologically sensitive areas along the Lake Tahoe shoreline and immediately adjacent areas.

In 2019, Cardno archeologists updated the 2014 record search. The updated record search was conducted at Nevada Cultural Resources Information System (NVCRIS) online cultural resources database and at the North-Central Information Center (NCIC) in Sacramento, California (IC No. PLA-19-31) within the Project APE, with no buffer, as no work will be occurring outside of the APE and site access would occur via existing developed facilities and roadways or by boat. Through research at the LTBMU, additional site records were identified within the APE that were recorded by archaeologist Charles Blanchard in 1988 as part of a volunteer effort for the LTBMU during a period of low lake levels. In 1988, Charles Blanchard spent the summer circumnavigating the Tahoe shoreline and recorded numerous exposed Ancestral Washoe archaeological sites and historic features.

The NVCRIS and NCIC records searches identified a total of 456 previously recorded cultural resources and 81 previously conducted cultural studies within the Project Area (refer to Table 3.6-1). Many of the identified resources represent resources Blanchard plotted on USGS topographic quadrangles and noted in his 1988 summary report and many of these sites/features have likely not been revisited since initial discovery. The prehistoric artifacts and features were noted as heavily water-worn and historic features were in various states of deterioration, so current conditions are indeterminate. Identified resources represent archaeological and environmental resources that later became inundated after growth or use (e.g., submerged prehistoric sites, submerged tree stumps), as well as features that represent remnants of Tahoe's recreational history (e.g., pier/dock remnants, boathouse rails, submerged watercraft).

Figure 3.6-1. Project APE



Sources: ArcGIS Online shaded relief map service; TRPA; Tahoe Resource Conservation District. Map date: November 14, 2019.

Table 3.6-1

Summary of Cultural Resources within the APE

Quadrangle (7.5)	Resource Type	Era	Category	Quantity
Tahoe City, CA	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	10
	Cultural Resources	Historic	Site/ Historic District	3
	Cultural Resources	Historic	Pier/ Pilings/ Dock Remnants	14
	Cultural Resources	Historic	Rails, Cable, Bricks	0
	Cultural Resources	Unknown	Rock Alignments/ Piles	1
	Cultural Resources	Historic	Linear: Roads, Ditches, RRs, Trails, Transmission	3
	Cultural Resources	Historic	Stumps	1
	Natural Features	Natural	Springs, Beaches, Rock	1
	Modern Features	Modern	Land Alterations	0
	Cultural Resources	Unknown	Sensitive Area	1
	Cultural Resources	Unknown	Unknown	29
	TOTAL			**63**
Kings Beach, CA	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	6
	Cultural Resources	Historic	Site/ Historic District	1
	Cultural Resources	Historic	Pier/ Pilings/ Dock Remnants	25
	Cultural Resources	Historic	Rails, Cable, Bricks	0
	Cultural Resources	Unknown	Rock Alignments/ Piles	6
	Cultural Resources	Historic	Roads, Ditches, RRs, Trails	0
	Cultural Resources	Historic	Stumps	0
	Natural Features	Natural	Springs, Beaches, Rock	2
	Modern Features	Modern	Land Alterations	1
	Cultural Resources	Unknown	Unknown	30
	TOTAL			**71**
Marlette Lake, NV	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	23
	Cultural Resources	Multicomponent	Site	1
	Cultural Resources	Historic	Site/ Historic District	7
	Cultural Resources	Historic	Pier/ Pilings/ Dock Remnants	3
	Cultural Resources	Historic	Rails, Cable, Bricks	1
	Cultural Resources	Unknown	Rock Alignments/ Piles	6
	Cultural Resources	Historic	Roads, Ditches, RRs, Trails	2
	Cultural Resources	Historic	Stumps	0
	Natural Features	Natural	Springs, Beaches, Rock	7
	Modern Features	Modern	Land Alterations	1
	Cultural Resources	Unknown	Unknown	1
	Cultural Resources	Unknown	Unknown	1
	TOTAL			**51**
Glenbrook, NV	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	15
	Cultural Resources	Historic	Site/ Historic District	9
	Cultural Resources	Historic	Pier/ Pilings/ Dock Remnants	4
	Cultural Resources	Historic	Rails, Cable, Bricks	0

Table 3.6-1

Summary of Cultural Resources within the APE

Quadrangle (7.5)	Resource Type	Era	Category	Quantity
	Cultural Resources	Unknown	Rock Alignments/ Piles	1
	Cultural Resources	Historic	Roads, Ditches, RRs, Trails	5
	Cultural Resources	Historic	Stumps	0
	Natural Features	Natural	Springs, Beaches, Rock	0
	Modern Features	Modern	Land Alterations	3
	Cultural Resources	Unknown	Unknown	3
	TOTAL			**40**
South Lake Tahoe, CA	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	6
	Cultural Resources	Multicomponent	Site	1
	Cultural Resources	Historic	Site/ Historic District	3
	Cultural Resources	Historic	Pier/ Pilings/ Dock Remnants	8
	Cultural Resources	Historic	Rails, Cable, Bricks	0
	Cultural Resources	Unknown	Rock Alignments/ Piles	0
	Cultural Resources	Historic	Roads, Ditches, RRs, Trails	3
	Cultural Resources	Historic	Stumps	3
	Natural Features	Natural	Springs, Beaches, Rock	1
	Modern Features	Modern	Land Alterations	2
	Cultural Resources	Unknown	Unknown	16
	TOTAL			**43**
Emerald Bay, CA	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	15
	Cultural Resources	Historic	Site/ Historic District	9
	Cultural Resources	Historic	Pier/ Pilings/ Dock Remnants	11
	Cultural Resources	Historic	Rails, Cable, Bricks	9
	Cultural Resources	Unknown	Rock Alignments/ Piles	5
	Cultural Resources	Historic	Roads, Ditches, RRs, Trails	0
	Cultural Resources	Historic	Stumps	6
	Natural Features	Natural	Springs, Beaches, Rock	2
	Modern Features	Modern	Land Alterations	0
	Cultural Resources	Unknown	Unknown	42
	Total			**99**
Meeks Bay, CA	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	9
	Cultural Resources	Historic	Site/ Historic District	0
	Cultural Resources	Historic	Pier/ Pilings/ Dock Remnants	11
	Cultural Resources	Historic	Rails, Cable, Bricks	2
	Cultural Resources	Unknown	Rock Alignments/ Piles	4
	Cultural Resources	Historic	Roads, Ditches, RRs, Trails	0
	Cultural Resources	Historic	Stumps	0
	Natural Features	Natural	Springs, Beaches, Rock	1
	Modern Features	Modern	Land Alterations	1

Table 3.6-1

Summary of Cultural Resources within the APE

Quadrangle (7.5)	Resource Type	Era	Category	Quantity
	Cultural Resources	Unknown	Unknown	21
	TOTAL			**49**
Homewood, CA	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	1
	Cultural Resources	Multicomponent	Site	2
	Cultural Resources	Historic	Site/ Historic District	0
	Cultural Resources	Historic	Pier/ Pilings/ Dock Remnants	19
	Cultural Resources	Historic	Rails, Cable, Bricks	1
	Cultural Resources	Unknown	Rock Alignments/ Piles	3
	Cultural Resources	Historic	Roads, Ditches, RRs, Trails	0
	Cultural Resources	Historic	Stumps	0
	Natural Features	Natural	Springs, Beaches, Rock	0
	Modern Features	Modern	Land Alterations	0
	Cultural Resources	Unknown	Unknown	13
	TOTAL			**39**
Mt. Rose, NV	Cultural Resources	Prehistoric/ Ethnographic	Isolates and Sites	1
	TOTAL			**1**
	TOTAL CULTURAL RESOURCES IN APE:			**456**

Current environmental review policies, in compliance with the TRPA's Code of Ordinances Section 29.5A and CEQA Section 15064.5, require that historical resources and unique archeological resources be considered as part of environmental documentation.

CEQA requires that projects financed by, or requiring the discretionary approval of public agencies in California, must consider the effects that a project has on historical and unique archaeological resources (PRC Section 21083.2). Historical resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance (PRC Section 50201). Archaeological resources occur in locations where human activity has measurably altered the earth or left deposits of prehistoric- or historic-era physical remains (e.g., stone tools, bottles, former roads, house foundations). Executive Order W-26-92 requires California state agencies in furtherance of the purposes and policies of the state's environmental protection laws and historic resource preservation laws, to the extent prudent and feasible within existing budget and personnel resources, to preserve and maintain the significant heritage (cultural and historical) resources of the state.

3.6.2 Environmental Impacts of the No Action Alternative

The No Action alternative would have no effect on cultural, archaeological, or historical values or religious concerns because there would be no measurable change in the condition of the natural environment upon which these values depend, and the Project Area is not identified as a Native American religious or sacred site.

3.6.3 Environmental Impacts of the Proposed Action Alternative

Table 3.6-2: Cultural, Archaeological, and Historical Resources				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.6-1. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? (CEQA Va)		X		
3.6-2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? (CEQA Vb)		X		
3.6-3. Disturb any human remains, including those interred outside of formal cemeteries? (CEQA Vc)		X		
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.6-4. Will the proposal result in an alteration of or adverse physical or aesthetic effect to a significant archaeological or historical site, structure, object or building? (TRPA 20a)		X		
3.6-5. Is the proposed project located on a property with any known cultural, historical, and/or archaeological resources, including resources on TRPA or other regulatory official maps or records? (TRPA 20b)		X		
3.6-6. Is the property associated with any historically significant events and/or sites or persons? (TRPA 20c)		X		

Discussion

3.6-1. Would the Project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? (CEQA Va)

Less than Significant with Mitigation Measures. The Project includes activities that may be screened by a qualified CRS and no further protection is recommended due to low potential of these actions to adversely affect cultural resources. These activities include hand pulling, benthic barriers, UV-C light treatment, and LFA. The Project also includes site-specific suction or mechanical dredging and diver-assisted hand suction removal that have the potential to adversely affect cultural resources through bed substrate disturbance. Based on the AIP control actions and the 2019 record search results, updated areas of Low, Moderate, High, and Undefined Sensitivity were developed, as described in Section 5 of the cultural resource report. Figure 3.6-2 depicts the location of undefined, low, moderate, and high sensitivity areas identified with the Project APE.

The 2019 records search identifies 456 resources within the Project APE, representing archaeological and paleontological resources that became inundated after growth or use (e.g., submerged prehistoric sites, submerged tree stumps) as well as features that represent remnants of Tahoe's recreational history (e.g., pier/dock remnants, boathouse rails, submerged watercraft). There are no known unique paleontological or geological resources at the control sites. However, should such resources be uncovered by Project activities, then AIP control actions would have the potential to disturb and adversely impact resources potentially eligible for listing on the National Register.

Due to the temporary nature and location of Project activities, significant impacts to historical or archaeological resources are not anticipated and no human remains would be exhumed. Known resources will be flagged, avoided, and protected. However, because some Project activities would disturb the lake or river bottom, the potential exists to uncover previously unidentified cultural resources. This potential impact would be reduced to a level of less than significant through implementation of **MITIGATION MEASURES CULT-1** through **CULT-3,** which assure compliance with existing regulations and ordinances protecting cultural resources. With these mitigation measures included as RPMs of the Project, AIP control actions are anticipated to have No Adverse Effect to Historic Properties per 36 CFR 800.5.

3.6-2. Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? (CEQA Vb)

<u>Less than Significant with Mitigation Measures.</u> See discussion and analysis for Question 3.6-1 above, which conclude potential impacts to archaeological resources would be reduced to a level of less than significant through implementation of **MITIGATION MEASURES CULT-1** through **CULT-3**, which assure compliance with existing regulations and ordinances protecting cultural resources.

3.6-3. Would the Project disturb any human remains, including those interred outside of formal cemeteries? (CEQA Vc)

<u>Less than Significant with Mitigation Measures.</u> See discussion and analysis for Question 3.6-1 above, which conclude potential impacts to archaeological resources would be reduced to a level of less than significant through implementation of **MITIGATION MEASURE CULT-1,** which assures compliance with existing regulations and ordinances protecting human remains.

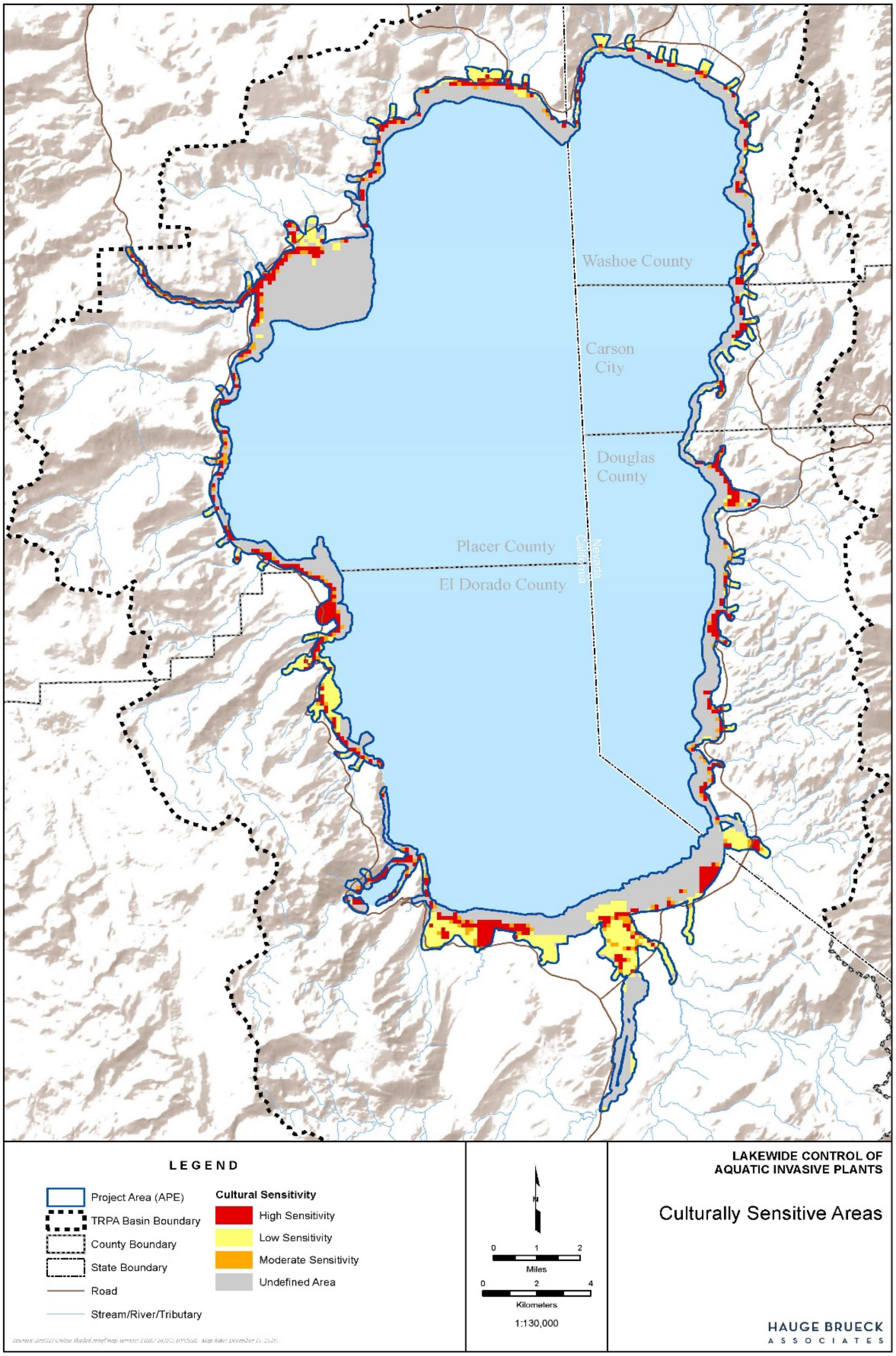
3.6-4. Will the Project result in an alteration of or adverse physical or aesthetic effect to a significant archaeological or historical site, structure, object or building? (TRPA 20a)

<u>No, with Mitigation</u>. See discussion and analysis for Question 3.6-1 above, which conclude potential impacts to archaeological or historical resources would be reduced to a level of less than significant through implementation of **MITIGATION MEASURES CULT-1** through **CULT-3**, which assure compliance with existing regulations and ordinances protecting such resources.

3.6-5. Is the Project located on a property with any known cultural, historical, and/or archaeological resources, including resources on TRPA or other regulatory official maps or records? (TRPA 20b)

<u>No, with Mitigation</u>. See discussion in Question 3.6-1 above regarding the mapped resources. The Project area is inclusive of properties with known cultural, historical and/or archeological resources, including resources on TRPA or other regulatory official maps or records. Potential impacts to cultural, historical, and archaeological resources would be reduced to a level of less than significant through implementation of **MITIGATION MEASURES CULT-1** through **CULT-3**, which assure compliance with existing regulations and ordinances protecting such resources.

Figure 3.6-2. Culturally Sensitive Areas within the Project APE



3.6-6. Is the Project associated with any historically significant events and/or sites or persons? (TRPA 20c)

No, with Mitigation. See discussions and analyses discussion for Question 3.6-1 above regarding historically significant events and or sites or persons, which concludes that potential impacts to such resources would be avoided or reduced to a level of less than significant through implementation of **MITIGATION MEASURES CULT-1** though **CULT-3.**

3.6.4 NEPA Analysis of Effects

Historic resources within the Lake Tahoe Basin reflect America's history and diverse cultures. The documentation, preservation, and interpretation of historic resources are integral to the LTBMU's management. Historic artifacts, sites, and features provide clues used to reconstruct human history in the Lake Tahoe Basin. The National Historic Preservation Act (NHPA) requires that Federal agencies take into account the effects that undertakings on federal lands could have on properties listed on or eligible to the National Register of Historic Places (NRHP), with an effects assessment accomplished through inventory, evaluation, and determination of effects in consultation with the State Historic Preservation Officer (SHPO), the public, and pertinent Native American Tribes.

The USACE has permitting authority over the Project actions under CWA Section 404 and is responsible for Section 106 compliance with the NHPA as a federal permitting agency. The NHPA requires federal agencies to take into account effects of projects on historic properties caused by federal actions, and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings through consultation with the State Historic Preservation Officer (SHPO).

The LTBMU has jurisdiction of federally designated forest areas of the United States within the Lake Tahoe Basin, as described in the Land Management Plan (LTBMU 2016) The Project falls under LTBMU jurisdiction as a federal land management agency. Approval of the Project requires preparation of an Environmental Assessment (EA), and the Project must also comply with the standards and guidelines of the Land Management Plan, commonly referred to as the Forest Plan.

Forest Service Manual 2360 outlines laws, Executive Orders, regulations, and Federal guidelines governing Forest Service Heritage Program Management. A program of research, protection, rehabilitation, and interpretation of cultural resources which are determined eligible for National Register of Historic Places or whose eligibility are undetermined is ongoing and effective. Known cultural resources are proactively managed to enhance their scientific, cultural, historical, and traditional values. LTBMU's cultural resources program is focused on three main areas of resource management: 1) providing education, interpretation, and research opportunities; 2) protecting archeological, historical, cultural and traditional resources; and 3) collaborative partnering with the Washoe Tribe and other heritage-resource interests. (LTBMU 2016). Protecting cultural resources on National Forest Lands (NFLs) includes both proactive and reactive efforts, as well as offering support to other resource programs. These efforts and supporting activities include inventory, resource identification, documentation, evaluation, monitoring, consultation, nomination, preservation, stabilization, and/or restoration of cultural resources, under direction in Section 106 and 110 of the NHPA. Most actions affected by Section 106 and 110 provisions are guided by the Forest Service Region 5's Programmatic Agreement with the SHPO and ACHP.

Cultural Resources Other Sources of Information:

- American Antiquities Act of June 8, 1906
- Historic Sites Act of 1935 as amended (16 USC 461-467)
- Protection of Archaeological Resources (36 CFR 296)
- Curation of Federally-Owned and Administered Archeological Collections (36 CFR 79)
- Protection of Historic Properties (36 CFR 800)
- Region 5 Amended Regional Programmatic agreement with the USFS and SHPO for Compliance with Section 106 of the National Historic Preservation Act.

This section discloses the environmental impacts of the proposed action, which includes each of the proposed AIP control methods described in the project description. Cultural resource impacts are evaluated in terms of NEPA Intensity Factors 1, 3, 7, 8, and 10.

Issue - Effects to Cultural and Heritage Resources

Direct and Indirect Effects

The NVCRIS and NCIC records searches identified a total of 456 record cultural resources within the Project APE, of this total 91 resources appear to be located on NFLs of the LTBMU (as stated in the cultural resource report). Cultural and heritage resources would be affected if AIP control activities will have an adverse effect to the integrity of the treatment area.

Hand pulling, benthic barriers, UV-C light treatment and LFA are control methods that may be screened by a qualified Cultural Resource Specialist (CRS) who meets the Secretary of Interior Standards in Archaeology and can make the determination that no further protection is recommended due to the low potential of these actions to adversely affect or impact cultural resources. Direct and indirect effects may result from AIP control methods that necessitate bed substrate disturbance, which include Hand Suction Removal and Hydraulic Suction and Mechanical Dredging. Due to the temporary nature and location of Project activities, significant impacts to historical or archaeological resources are not anticipated and no human remains would be exhumed. Known resources will be flagged, avoided, and protected. However, because some Project activities would disturb the lake or river bottom, the potential exists to uncover previously unidentified cultural resources. This potential impact would be reduced to a level of less than significant through implementation of **MITIGATION MEASURES CULT-1** through **CULT-3**, which assure compliance with existing regulations and ordinances protecting cultural resources and implement Forest Plan SG 120 (Except as noted in the foregoing guideline, record cultural artifacts in detail in the field, and leave them in place) and SG 118 (When avoidance of adverse impacts is not possible, authorize impacts to significant properties only after negotiating and signing a Memorandum of Agreement between the Forest Service and/or the appropriate State Historic Preservation Officer and Advisory Council on Historic Preservation). With these mitigation measures included as RPMs of the Project, AIP control actions are anticipated to have No Adverse Effect to Historic Properties

Cumulative Impacts

There will be "no adverse effect" from AIP control actions to cultural and heritage resources. Cultural resources within the Project APE will be protected and avoided through implementation of **MITIGATION MEASURES CULT-1** through **CULT-3**. Because potential project-level effects would not result, direct and indirect effects would not combine to result in adverse cumulative impacts.

3.6.5 Environmental Commitments and Mitigation Measures

The cultural resources analysis determines that **MITAGATION MEASURES CULT-1, CULT-2, and CULT-3** are necessary to reduce potential impacts to cultural and heritage resources to a level of less than significant.

Mitigation Measure CULT-1: Unanticipated Discovery

1. In the event of an unanticipated discovery of previously-undocumented cultural resources during project activities, work will be suspended in the area until the Lake Tahoe Basin Management Unit (LTBMU) Heritage Program Manager (HPM) or US Army Corps of Engineers (USACE) Cultural Resources Specialist (CRS), or TRPA/applicable State Historic Preservation Officer (SHPO) can assess the find and develop and implement appropriate avoidance, preservation, or recovery measures. If archaeological or paleontological features are discovered during project implementation, all submerged artifacts and/or features will be marked, left in place, and reported to the appropriate HPM, CRS, or SHPO. Pursuant to

TRPA Code of Ordinances Sections 67.3 and 67.4, upon discovery of a site, object, district, structure, or other resource, potentially meeting the criteria of Section 67.6, all operations shall stop until a qualified archaeologist has evaluated the potential significance of the resource, and TRPA shall consider the resource for designation as a historic resource and shall consult with the applicable SHPO, and with the Washoe Tribe if it is a Washoe site. If the resource initially is determined to be eligible for designation as a historic resource by the SHPO, TRPA shall consider designation pursuant to Section 67.6 and 67.5 of the TRPA Code of Ordinances and a resource protection plan developed pursuant to Section 67.3 of the TRPA Code of Ordinances.

2. In the event that human remains are discovered during project activity, work will cease immediately in the area of the find and the project manager/site supervisor will notify the appropriate personnel. Any human remains and/or funerary objects will be left in place. Existing law requires that project managers contact the County Coroner. If the County Coroner determines the remains are of Native American origin, both the Native American Heritage Commission (NAHC) and any identified descendants shall be notified (Health & Safety Code, § 7050.5; Pub. Res., Public Resources Code, §§ §5097.97 and 5097.98).

3. Tahoe RCD staff will work closely with the SHPO, U.S. Army Corps of Engineers and the LTBMU or designated CRS to ensure that its response to such a discovery is also compliant with federal requirements including the Native American Graves Protection and Repatriation Act. Work will not resume in the area of the find until proper disposition is complete (Pub. Res. Code, PRC §5097.98).

4. No human remains or funerary objects will be cleaned, photographed, analyzed, or removed from the site prior to determination. If it is determined the find indicates a sacred or religious site, the site will be avoided to the maximum extent practicable. Formal consultation with the State Historic Preservation Office and review by the NAHC/Tribal Cultural representatives will occur as necessary to define additional avoidance, preservation, or recovery measures, or further future restrictions.

5. If treatment involves disturbance of the lake bottom in culturally sensitive areas, an underwater archaeological survey will be conducted by a qualified SOI archaeologist underwater specialist in the project Area of Potential Effect (APE) to determine if previously recorded or newly identified cultural resources exist in the area. Results of the survey will be documented in an archaeological survey report and submitted to land agencies and the appropriate Information Center.

Mitigation Measure CULT-2: Class 1 Avoidance

1. Proposed activities shall avoid historic properties. Avoidance means that no activities associated with undertakings that may affect historic properties, unless specifically identified in this Measure as approved Class 2 On-Site Management Measures, shall occur within historic property boundaries, including any defined buffer zones. Portions of AIP activities may need to be modified, redesigned, or eliminated to properly avoid historic properties. All activities performed under Class 1 Avoidance must be documented.

2. To the extent possible, historic properties within the APE shall be clearly delineated prior to implementing any associated activities that have the potential to affect historic properties.

3. Buffer zones may be established to ensure added protection. The use of buffer zones to avoid historic properties may be applicable where setting contributes to property eligibility under 36 CFR 60.4, or where setting may be an important attribute of a historic properties or where heavy equipment is used in proximity to historic properties.

Mitigation Measure CULT-3: Class 2 On-site Historic Property Management Measures

1. Written approval for a proposed ground disturbing activity within or adjacent to the boundaries of a historic property will be based the LTBMU HPM or USACE CRS or other delegated qualified Cultural Resource Specialist, who is a Secretary of Interior qualified archaeologist, professional judgement and will be made on such activities that will not have an adverse effect on historic properties, or under carefully controlled conditions such as those specified below. All activities performed as Class 2 On-Site Historic Property Management Measures must be documented. Additional on-site archaeological monitoring may be required to test the effectiveness of management measures.

2. Management Measures:
   - All concentrated work areas (e.g., staging areas, turnarounds, and equipment sites) shall be located outside historic property boundaries.
   - Placement of foreign, non-archaeological material (e.g., padding or filter cloth) within transportation corridors (e.g., designated roads or trails, staging areas, equipment sites, boat ramps, etc.) over archaeological deposits or historic features to prevent surface and subsurface impacts caused by vehicles or equipment. Such foreign material may be utilized on historic properties under the following conditions:
     - Design the foreign material depth to acceptable professional standards;
     - Design the foreign material use to assure that there will be no surface or subsurface impacts to archaeological deposits or historic features;
     - The foreign material must be easily distinguished from underlying archaeological deposits or historic features;
     - The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; and
     - The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date.
   - No skidding nor tracked equipment shall be allowed within historic property boundaries.
   - Placement of barriers within or adjacent to site boundaries to prevent access to or disturbance of deposits or historic features, or for protection of other sensitive resources on-site, when such barriers do not disturb subsurface deposits or lead to other effects to the site.
   - A CRS shall approve the use of tracked equipment to remove vegetation from within specifically identified areas of site boundaries under prescribed measures designed to prevent or minimize effects.
   - A CRS shall determine whether mechanical equipment treatments within site boundaries shall be monitored, and how such monitoring shall occur.
   - If standard management measures cannot provide appropriate protection, undertakings shall be subject to the provisions of 36 CFR part 800.

3.7 ENERGY

3.7.1 Setting

The Project Area consists of waters infested with AIP in Lake Tahoe and associated tributaries and marshes. Since the Project Area is a habitat area, there are energy sources in the vicinity that serve urban uses, but the habitat in the waterways themselves do not utilize or consume energy. Energy used by urban uses in the area includes electricity, natural gas, gasoline and diesel fuel, and renewable energies.

3.7.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP control and removal activities, and therefore, would result in no expenditure of energy. However, failure to implement control activities allows AIP populations to flourish and infestations to spread. If AIP are treated later through other projects, the energy required to effectively treat the populations increases because the size and density of the infestation will have grown and more energy-intensive control methods would be necessary.

3.7.3 Environmental Impacts of the Proposed Action Alternative

Evaluation Criteria are based on the planning guidelines established by the State of California, TRPA, and County codified regulations and the TRPA thresholds for land coverage.

Table 3.7-1: Energy

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.7-1. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? (CEQA VIa)			X	
3.7-2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? (CEQA VIb)				X
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.7-3. Use of substantial amounts of fuel or energy? (TRPA 15a)				X
3.7-4. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy? (TRPA 15b)				X

Discussion

3.7-1. Would the Project result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? (CEQA VIa)

Less than Significant Impact. The Project utilizes fuel to operate equipment used for mechanical and suction dredging, diver assisted suction dredging, UVC light, and aeration, and to a lesser degree benthic barriers with delivery of materials. Energy would be consumed while these control methods are actively engaged or installed, in the case of benthic barriers. Therefore, energy would be consumed for a few days or weeks per control site. Dredging utilizes more energy than other methods due to fuel consumption, however, this method would be limited to areas previously dredged, and operations would occur for a period of a few days. Furthermore, dredging can quickly treat large areas, so that energy consumption does not occur for long periods. UVC light requires the operation of a treatment vessel that consumes fuel. Aeration requires an air compressor for operations. The air compressor is electrically powered through connection to existing electrical outlets at the marinas. While energy is consumed to operate the aeration system, the quantity of electricity consumed is similar to that of household appliances. Once areas are treated with more aggressive measures, they can be maintained through less aggressive methods, such as monitoring and hand-pulling, which do not require non-renewable energy consumption.

The Project also includes monitoring efforts so that infestations can be tracked, prioritized, and controlled early before plant populations or densities grow. If allowed to grow and expand, AIP populations become more difficult to control and more intense control measures must be implemented for a greater period of time, thereby consuming larger quantities of energy.

3.7-2. Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency? (CEQA VIb)

No Impact. The Project temporarily consumes energy resources in quantities too small to affect plans for renewable energy or energy efficiency.

3.7-3. Will the Project result in use of substantial amounts of fuel or energy? (TRPA 15a)

No. As discussed in Question 3.7-1, fuel would be used to operate machinery and equipment for mechanical and suction dredging, diver assisted suction dredging, UV light control, installation of benthic barriers, and aeration; however, use of energy would occur temporarily over the course of a few days. While diesel powered equipment uses fuels, these fuels would not be used on a daily or ongoing basis. Once areas are treated, they can be maintained through monitoring and hand-pulling or other less aggressive methods that do not require fuel.

3.7-4. Will the Project result in substantial increase in demand upon existing sources of energy, or require the development of new sources of energy? (TRPA 15b)

No. The control methods that utilize fuel energy would not increase demand for energy such that new sources would need to be acquired or developed.

3.7.4 NEPA Analysis of Effects

No adverse effect would occur. Although some energy would be consumed, ranging from small amounts of electricity to run aeration air compressors to diesel fuels used to operate dredging machinery, the consumption of energy would be temporary and variable, depending on which control method is used and would not violate Federal regulations pertaining to energy use. No significant quantities of energy consumption would occur, and no cumulative impact would result.

3.7.5 Environmental Commitments and Mitigation Measures

The energy analysis determines no mitigation measures are necessary.

3.8 GEOLOGY, SOILS, AND LAND

3.8.1 Setting

Lake Tahoe lies within the Sierra Nevada Geomorphic Province, occupying a basin surrounded by peaks of the Sierra Nevada Mountains with Freel Peak the highest at 10,891 feet. The eastern and western sides of the basin are composed of granite rock, with minor amounts of older metamorphic rock. Volcanic rock, some deposited as recently as 2.5 million years ago, covers most of the northern and some of the southern part of the basin. The Sierra Nevada is a gently sloping fault block mountain range that was uplifted along its eastern edge. This range is bounded on the east and west by a series of interconnected fault segments. The displacement has been greater on the eastern margin, giving the Sierra Nevada a western tilt. South of Lake Tahoe, there is a single crest dividing the gentle western slope from the steep eastern scarp. The crest splits south of the lake, with one crest trending northwesterly and the other crest trending northward creating the Carson Range. This range separates the Carson Valley from Lake Tahoe. Lake Tahoe occupies the basin between the two uplifted crests.

<u>Geology.</u> The Lake Tahoe Basin was formed two to three million years ago by geologic block faulting between the northwest-trending Sierra Nevada to the west and the north-trending Carson Ridge to the east. Lake Tahoe occupies the depression, or fault-produced graben, between these two uplifted mountain ranges. During the past two million years, glaciers played an active roll in shaping the Sierra Nevada Mountains and Lake Tahoe. Alpine glaciers extended below the current lake level along the west shoreline and Emerald Bay. The basement geology of the Lake Tahoe Basin is divided into three categories: granitic, metamorphic and volcanic (Hyne et al. 1972).

<u>Soils.</u> Most of the soils in the Lake Tahoe Basin are of granitic or volcanic parent material. The soils are geologically young and poorly developed. Most soils are shallow, coarse textured, and have low cohesion, and contain small amounts of organic material. These attributes account for a high erosion potential on steeper slopes in the Tahoe Basin. The subsurface of the lake in the Project Area is variable, but consists of cobble and sand at most of the control sites.

<u>Seismicity.</u> The potential for seismic activity within a Project Area is primarily related to the proximity of faults. Faults are fractures or zones of related fractures where the rocks on one side have been displaced with respect to rocks on the other side. An “active fault” is defined as one that has had surface displacement within the past 11,000 years, the Holocene. Potentially active faults are defined as those that have ruptured between 11,000 and 1.6 million years before the present (Quaternary). Faults are generally considered inactive if there is no evidence of displacement during the Quaternary period.

The Lake Tahoe Basin is located in a region of Holocene age and early Quaternary age, as evidenced by the features and historical data published in Natural Hazards of the Lake Tahoe Basin (Cooper, Clark and Associates 1974) and Preliminary Maps of Pleistocene to Holocene Faults in the Lake Tahoe Basin, California and Nevada (Saucedo 2005):

Movements have taken place along faults adjacent to the basin within historical time (Lawson 1912; Kachadoorian 1967);

- Sediments at the bottom of Lake Tahoe show offsets or displacements that are indicative of faulting; and
- Steep cliffs (30 to 45 degree slopes) and other topographic features associated with active faulting are found on both sides of Lake Tahoe (Hyne et al. 1972).

A north-south fault zone, located about six miles east of the Lake Tahoe Basin, separates the eastern edge of the Sierra Nevada from the parallel fault-block mountains of Nevada and Utah. The north-south faults along the shores of Lake Tahoe appear to be the longest continuous faults traversing the basin area. Of these faults, the fault along the west side of the lake appears to be the longest, with a surface length of approximately 50 miles. A fault of this length could potentially generate a 7.5 magnitude earthquake (Cooper, Clark and Associates 1974).

The Preliminary Resource Element for Sugar Pine Point State Park (CDPR 1991) characterizes the seismicity of the Lake Tahoe Basin. The fault activity has played a major, geologically recent role in the evolution of the Tahoe Basin, and the potential for a large destructive earthquake sometime in the future should be considered to be high. Relative to much of the rest of California, however, the earthquake shaking potential (Branum et al. 2008) and earthquake hazard (USGS and CGS 2010) in the Project Area are low. Rather than a single linear fault, the Sierra

Nevada frontal fault system is a complex zone of faults along the eastern face of the Sierra Nevada. The western Lake Tahoe boundary fault, and the mountains that rise above the western edge of Emerald Bay, very likely represent a segment of the Sierra Nevada fault system.

Based upon physiographic evidence, the main fault on the west side of the Lake Tahoe Basin probably lies less than a mile east of the shore at Ed Z'berg-Sugar Pine Point State Park, about 0.5 mile east of the shore at Rubicon Point, and continues south immediately offshore of Eagle Point at the mouth of Emerald Bay, heading inland at Baldwin Beach.

Since the 1900's, a number of earthquakes with an intensity of less than 5.0 Richter magnitude have been recorded in the Basin, although historical epicenters are more common to the north of Lake Tahoe and to the south-southeast of the Lake Tahoe Basin along the Sierra Nevada frontal fault system. Both of these areas have experienced moderate to high magnitude earthquake activity measuring between 5.0 and 7.5 on the Richter scale. Since Lake Tahoe is a large, enclosed body of water, seiche activity of varying magnitude, depending on the location and intensity of the seismic activity, has occurred within the shoreline areas during seismic events.

Liquefaction and Landslide Hazards. Secondary seismic hazards, such as liquefaction and landslides, may occur during an earthquake. Liquefaction could occur in loose, granular materials (alluvium) below the water table, such as along stream channels and in unconsolidated, disturbed materials. It takes place when a granular material is transformed from a solid state to a liquid state during earthquake events. The potential for liquefaction as a result of seismic events is high in areas of unconsolidated and saturated fine-grained alluvium such as at the mouth of creeks.

Regulations. There are regulatory laws governing geologic protection and safety from geological hazards. For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under CEQA.

Other federal regulations include the Earthquake Hazard Reduction Act of 1977, Executive Order 12699 on Seismic Safety of Federal Buildings, and the Uniform Building Code (superseded in California by the 2016 California Building Code). State regulations include the Alquist-Priolo Earthquake Zone Act, the Field Act, the 2016 California Building Code, the Seismic Hazards Mapping Act, and the Historic Structures Act (California PRC 5028). Some state agencies have their own regulations covering seismic and geologic hazards.

In the Lake Tahoe Basin, TRPA Goals and Policies, Soils (1986), Goal #1 is stated as "Minimize soil erosion and the loss of soil productivity." This goal is to maintain soil productivity and existing vegetation cover and prevent excessive sediment and nutrient transport to streams and lakes.

3.8.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP control and removal activities, and therefore, would result in no direct or indirect effects to geology and soils of the Project Area.

3.8.3 Environmental Impacts of the Proposed Action Alternative

Evaluation Criteria are based on the planning guidelines established by the State of California, TRPA, and County codified regulations and the TRPA thresholds for land coverage.

Table 3.8-1: Geology, Soils, and Land				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.8-1. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42? ii) Strong seismic ground shaking? iii) Seismic-related ground failure, including liquefaction? iv) Landslides? (CEQA VIIa)				X
3.8-2. Result in substantial soil erosion or the loss of topsoil? (CEQA VIIb)			X	
3.8-3. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? (CEQA VIIc)				X
3.8-4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? (CEQA VIId)				X
3.8-5. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? (CEQA VIIe)				X
3.8-6. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (CEQA VIIf)				X

TRPA Initial Environmental Checklist Item	Yes	No, With Mitigation	Data Insufficient	No
3.8-7. Compaction or covering of the soil beyond the limits allowed in the land capability or Individual Parcel Evaluation System (IPES)? (TRPA 1a)				X
3.8-8. A change in the topography or ground surface relief features of site inconsistent with the natural surrounding conditions? (TRPA 1b)				X
3.8-9. Unstable soil conditions during or after completion of the proposal? (TRPA 1c)				X
3.8-10. Changes in the undisturbed soil or native geologic substructures or grading in excess of 5 feet? (TRPA 1d)				X
3.8-11. The continuation of or increase in wind or water erosion of soils, either on or off the site? (TRPA 1e)				X
3.8-12. Changes in deposition or erosion of beach sand, or changes in siltation, deposition or erosion, including natural littoral processes, which may modify the channel of a river or stream or the bed of a lake? (TRPA 1f)				X
3.8-13. Exposure of people or property to geologic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards? (TRPA 1g)				X

Discussion

3.8-1. Would the Project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

3.8-1.i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42? (CEQA VIIa).

No Impact. Seismic ground shaking is possible from earthquake events along the faults discussed above in the Environmental Setting.

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 was implemented to regulate development near active faults and to prevent construction of buildings for human occupancy on or near active faults (i.e., that have ruptured within the past 11,000 years). The designated zone extends from 200 to 500 feet on both sides of known active fault traces. Under the Act, no buildings intended for human occupancy may be constructed on or within fifty feet of an active fault trace. The control sites are not located within an Alquist-Priolo Earthquake Fault Zone as designated by the California Geological Survey (CGS 2007). No structures that are designed for human occupancy are located at the control sites and no permanent structures are proposed as part of this Project. Therefore, there is no expected adverse effect on people or structures with regard to earthquake rupture as a result of implementation of this Project.

3.8-1.ii) Strong seismic ground shaking?

No Impact. Seismic ground shaking may occur during an earthquake with an epicenter located in the vicinity of Lake Tahoe. However, Project activities would not increase the risk of exposure of employees or contractors working in the forest and open space to a seismic event. Therefore, the potential risk of effects to staff, contractors, or the public is considered to be less than significant.

3.8-1.iii) Seismic-related ground failure, including liquefaction?

No Impact. Seismic-induced ground failure, such as liquefaction, usually occurs in unconsolidated granular soils that are water saturated. During seismic-induced ground shaking, pore water pressure in the soil could increase in loose soils, causing the soils to change from a solid to a liquid state (liquefaction). Potential for liquefaction in the Project Area would not increase as a result of the Project. Therefore, the potential risk of effects to staff, contractors, or the public is considered to be less than significant.

3.8-1.iv) Landslides?

No Impact. Portions of the Project Area have potential for coherent landslides in the event of an earthquake in the Lake Tahoe Basin. This is an existing condition and the Project would not increase this potential hazard. Therefore, the potential risk of effects to staff, contractors, or the public is considered to be less than significant.

3.8-2. Would the Project result in substantial soil erosion or the loss of topsoil? (CEQA VIIb)

Less than Significant Impact. Benthic barriers would be placed over the top of the underwater substrate in control sites. UVC light treatment and LFA would not affect soils as the UVC light vessel would enter the water via existing boat ramps and the aeration diffusers or lines would simply rest on the bed of the waterway and require no movement of soils. In addition, some portions of the Project Area may be treated with hand removal, diver-assisted suction removal, suction dredging, or mechanical dredging. Hand removal and diver-assisted suction removal may disturb small amounts of soil as AIP roots are pulled up; however, this would not result in erosion or substantial loss of topsoil. Dredging would result in removal of underwater soils as plant and soil materials are dug or cut and collected for disposal. AIP removal dredging is proposed only in areas where marina maintenance dredging has been previously permitted and implemented and only to the extent and depth previously permitted. These areas have been previously disturbed. Underwater plant control activities in Lake Tahoe require permits from the USACE, Lahontan, TRPA, CSLC, NDSL, NDEP, and the CDFW. These permits require monitoring and protective measures to ensure that project activities do not result in negative effects to a water body. Control actions would not contribute to soil erosion and necessary permits would be attained prior to commencing Project activities to reduce potential impacts to a less than significant level.

3.8-3. Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? (CEQA VIIc)

No Impact. Benthic barriers would be placed over the top of the lake or channel bottom substrate in control sites. UVC light and aeration control methods would not affect geologic stability. Some portion of the control sites may be treated with diver-assisted suction removal, suction dredging, or mechanical dredging. These actions would not contribute to instability of soil to cause landslide, lateral spreading, subsidence, liquefaction, or collapse. Dredging would be limited to those areas previously dredged for maintenance and to the extent previously dredged.

3.8-4. Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? (CEQA VIId)

No Impact. Expansive soils are those soils that have high clay content that swell when wet and shrink when dry. Soils in the Project Area do not have high clay content, are therefore not expansive, and would not result in a substantial risk to life and property. No habitable structures are proposed.

3.8-5. Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? (CEQA VIIe)

No Impact. The Project does not involve the installation or use of waste disposal systems, and therefore, would not result in impacts to onsite soils.

3.8-6. Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (CEQA VIIf)

No Impact. There are no unique geologic features or known paleontological sites located within the control sites. Mechanical and suction dredging would be limited to marina areas where dredging has been previously permitted and conducted. Therefore, these areas have already been disturbed. Diver-assisted suction removal, hand removal, and installation of aeration systems and benthic barriers would not affect such resources due to the low level of soil disturbance, which would be limited to plant root depth. UVC light control methods would not affect soils. No significant impact would occur.

3.8-7. Would the Project result in compaction or covering of the soil beyond the limits allowed in the land capability or Individual Parcel Evaluation System (IPES)? (TRPA 1a)

No. No compaction or coverage is proposed. Activities would occur beneath the surface of the water and no permanent coverage or impervious surfacing would be installed. No impact.

3.8-8. Will the Project result in a change in the topography or ground surface relief features of site inconsistent with the natural surrounding conditions? (TRPA 1b)

No. See the discussion under Impacts 3.8-2 and 3.8-6. Activities would occur beneath the surface of the water and no grading is proposed. While dredging activities could change the surface features, no inconsistency with the surrounding conditions would result. No impact.

3.8-9. Will the Project result in unstable soil conditions during or after completion of the proposal? (TRPA 1c)

No. See the discussion under Impact 3.8-3 regarding soil stability. No impact would occur.

3.8-10. Will the Project result in changes in the undisturbed soil or native geologic substructures or grading in excess of 5 feet? (TRPA 1d)

No. While grading is not proposed, dredging may be utilized in marinas where dredging has been previously permitted and implemented. Some portions of the Project Area may be treated with diver-assisted hand removal, suction dredging, or mechanical dredging. Underwater plant control activities in Lake Tahoe require permits from the USACE, Lahontan, TRPA, CSLC, NDSL, NDEP, and the CDFW. These permits require monitoring and protective measures to ensure that project activities do not result in negative effects to a water body. Dredging would be limited to those areas previously dredged for maintenance and to the extent those marinas were previously dredged, thereby limiting the action to previously disturbed areas. UVC light control methods would not disturb soils and aeration systems would be placed on top of the lake or channel bed, but would not require soil alteration or grading. Hand pulling or suction methods could disturb soils as roots are pulled, but this action would not result in a significant impact to soils or substructures. Control actions would not contribute to soil erosion and necessary permits would be attained prior to commencing Project activities to reduce potential impacts to a less than significant level. Soil disturbance at depths greater than 5 feet would not occur.

3.8-11. Will the Project result in the continuation of or increase in wind or water erosion of soils, either on or off the site? (TRPA 1e)

No. See the discussion under Impact 3.8-3 regarding erosion.

3.8-12. Will the Project result in changes in deposition or erosion of beach sand, or changes in siltation, deposition or erosion, including natural littoral processes, which may modify the channel of a river or stream or the bed of a lake? (TRPA 1f)

No. No changes to the deposition or erosion of beach sand are proposed. If mechanical dredging equipment in located on land, movement of the machinery on soils has the potential to cause siltation; however, such activity would be limited to marinas in which dredging has been previously permitted and performed, resulting in no new changes. Turbidity and silt curtains would be used to protect the waters and control siltation and lake function. Likewise, removal of aquatic invasive plants and their root systems can result in minor brief increases in siltation as the soils within the lake, tributaries, and marshes would be disturbed to fully remove the plants. Underwater plant control activities in Lake Tahoe require permits from the USACE, Lahontan, TRPA, CSLC, NDSL, NDEP and the CDFW. These permits require monitoring and protective measures to ensure that project activities do not result in negative effects to a water body.

3.8-13. Will the Project result in exposure of people or property to geologic hazards such as earthquakes, landslides, backshore erosion, avalanches, mudslides, ground failure, or similar hazards? (TRPA 1g)

No. See the discussion under Impact 3.8-1.

3.8.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Impacts are analyzed in relation to the NEPA Intensity factors 1 and 7. Implementation of the control methods is consistent with 2016 Forest Plan as the methods either do not require the use of wheeled vehicles or because vehicles would be limited to existing roadways and access points (SG11).

Issue - Soil Disturbance and Displacement

Direct and Indirect Effects

Each control method would result in some disturbance of underwater soils within the limits of the treatment area; however, the degree of disturbance varies, with hand pulling or UVC light resulting in little to no soil disturbance, and suction and dredging methods resulting in larger disturbance as soils are moved or removed to harvest the AIP root systems. Installation and removal of benthic barriers and aeration systems would result in only small amounts of soil shifting as materials are secured in place or removed. Equipment and materials would be staged in parking areas, on piers, or other developed marina areas, and on floating vessels or barges when necessary. Where heavy equipment is stationed on land, movement or placement of that equipment may also shift beach soils; however, silt fencing and erosion control devices would be used to prevent erosion and soil movement. Some degree of soil movement can be expected for any vegetation management activity. Dredging activities would include the use of silt or turbidity curtains to protect water quality and prevent siltation and material deposition, and would be limited to marinas in which previously permitted and implemented maintenance dredging has previously occurred, resulting in no new change to the soil. Permanent impairment or substantial alteration of the soil would not occur, and the proposed activities would be required to obtain and comply with the appropriate permit requirements established for each type of control method. Most control methods proposed or that would be most commonly used are those with lower soil disturbance potential. No unique geologic features would be affected.

Cumulative Impacts

The cumulative impacts of the proposed action would be in relation to erosive or other water channel disturbing activities in and around Lake Tahoe. If dredging were proposed at the marina control sites, then AIP removal and control could occur only in areas previously permitted and dredged an only to the extent and depth of the previous maintenance dredging, resulting in no new impact and no cumulative contribution to soil disturbance. Therefore, the repeated dredging of the area would not contribute to a cumulative impact. As stated above, most of the control methods used under the proposed action would result in low levels of soil disturbance. The volume of impact would not be cumulatively considerable.

3.8.5 Environmental Commitments and Mitigation Measures

The earth resource analysis determines no mitigation measures are necessary. Required permits associated with the various control methods would be followed, including implementation of RPMs and Best Management Practices (BMPs).

3.9 GREENHOUSE GAS EMISSIONS

3.9.1 Setting

Greenhouse gases (GHG) such as carbon dioxide and methane trap heat in the earth's atmosphere. Increased concentrations of these gases over time produce an increase in the average surface temperature of the earth. The rising temperatures can in turn produce changes in precipitation patterns, storm severity, and sea level, resulting in what is commonly referred to as "climate change."

Global climate change is caused in large part by anthropogenic (human caused) emissions of GHGs released into the atmosphere through the combustion of fossil fuels and by other activities that affect the global GHG budget, such as deforestation and land use change. According to the California Energy Commission (CEC), GHG emissions in California are attributable to human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors as well as natural processes (California Energy Commission, 2006a).

Carbon Dioxide (CO_2) is the primary GHG attributed to the Project. CO_2 accounts for more than 75% of anthropogenic GHG emissions. Increasing concentrations of CO_2 in the atmosphere are largely due to emissions from the burning of fossil fuels, gas flaring, cement production, and land use changes such as vegetation removal and large-scale agriculture. The Project removes aquatic invasive plant species from water bodies at a scale that would not increase CO_2 emissions, unlike forest management action such as clear cutting and fuels reductions.

The Project Area includes no existing facilities. Water pumping and usage generate small amounts of GHG emissions. In addition, fuel usage from vehicles and haul trucks traveling to and from the control sites represent an additional source of GHG emissions.

In order to simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method to compare GHG emissions is the "global warming potential" methodology defined in the Intergovernmental Panel on Climate Change (IPCC) reference documents (IPCC 1996; IPCC 2001). The IPCC defines the global warming potential (GWP) of various GHG emissions in terms of CO_2 equivalents (CO_2e), which compares the GHG in question to that of the same mass of CO_2 (by definition, CO_2 has a global warming potential (GWP) of 1.0).

CARB completed a GHG inventory of California's 2006 GHG emissions in 2009 and the state's 2017 GHG emissions in 2019. Their 2009 report states that 1990 emissions amounted to 433.3 million metric tons (MMT) of carbon dioxide equivalent (CO_2e), while 2006 emissions levels rose to 483.9 MMT of CO_2e (CARB 2009). Based on California's 2006 population of 37,114,598, this amounted to approximately 13 metric tons of CO_2e per person (State of California, Department of Finance 2008). The 2017 inventory showed GHG emissions decreasing, where 2017 GHG emissions accounting for 424 MMT of CO_2e, which was 5 MMT of CO_2e less than 2016 levels, despite economic and population growth. Since 2016 GHG emissions have been below the 2020 limit of 431 MMT of CO_2e (CARB 2019)

The California State laws and policies have been implemented to reduce the amount of GHG generated each year. As stated in Assembly Bill 32, Global Warming Solutions Act (AB 32), passed in 2006; "The State of California found that Global Warming would have detrimental effects on some of California's largest industries including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry." AB 32 requires statewide GHG emissions in California be reduced to 1990 levels by the year 2020 and requires the CARB to adopt rules and regulations to achieve this goal.

In California, CDPR has developed a "Cool Parks" initiative to address climate change within the State Park system. Cool Parks proposes that CDPR itself, as well as resources under its care, adapt to the environmental changes resulting from climate change. In order to fulfill the Cool Parks initiative, CDPR is dedicated to using alternative energy sources, low emission vehicles, recycling and reusing supplies and materials, and educating staff and visitors on climate change (CDPR 2008).

Some GHG such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and through human activities. Naturally occurring greenhouse gasses include water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

In Nevada, NDEP's 2016 Nevada Statewide Greenhouse Gas Emissions Inventory and Projections, 1990-2030 indicate the state's 2013 gross GHG emissions were 44.039 MMT of CO_2e and net GHG totaled 39.251 MMT of CO_2e, which are less than the 2005 emissions of 60.362 MMT of CO_2e. As in California, Nevada emissions have been declining, and therefore, GHG emissions within the project area have also been declining. In 2013, the California Tahoe Conservancy Regional Greenhouse Gas Emissions Inventory for the Lake Tahoe Region found the region-wide annual GHG emissions levels to be 1,398,554 metric tons of CO_2e, caused primarily by wildfire and prescribed burns and transportation sources. By comparison, the primary source of GHG emissions in both California and Nevada were electricity consumption, followed by transportation. (TRPA Sustainable Communities Program, 2013)

Water Vapor. Water Vapor is the most abundant GHG in the atmosphere. Changes in its concentration are considered a result of climate feedback loops related to the warming of the atmosphere rather than a direct result of human activities. The feedback loop that involves water is critically important to projecting future climate change. As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the absolute humidity can be higher (in essence, the air is able to 'hold' more water when it's warmer), leading to more water vapor in the atmosphere. As a greenhouse gas, the higher concentration of water vapor is then able to absorb more thermal energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a 'positive feedback loop'. However, scientific uncertainty exists in defining the extent and importance of this feedback loop. As water vapor increases in the atmosphere, more of it would eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up).

Carbon Dioxide. The natural production and absorption of carbon dioxide (CO_2) is achieved through the terrestrial biosphere and the ocean. Changes in its concentration are primarily a direct result of human activity. Carbon dioxide also enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees, and wood products, and as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (or "sequestered") when absorbed by plants as part of the biological carbon cycle. Carbon dioxide was the first greenhouse gas demonstrated to be increasing in atmospheric concentration with the first conclusive measurements being made in the last half of the 20th century.

Methane. Methane (CH_4) has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands (at the roots of the plants). Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills. Methane is an extremely effective absorber of radiation, though its atmospheric concentration is less than CO_2 and its lifetime in the atmosphere is brief (10-12 years), compared to some other greenhouse gases (such as CO_2, N_2O, CFCs).

Nitrous Oxide. Nitrous Oxide (N_2O) is produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.

Concentrations of nitrous oxide began to rise at the beginning of the industrial revolution and it is understood to be produced by reactions that occur in fertilizer containing nitrogen. Increasing use of these fertilizers has occurred over the last century (NOAA 2010).

Ozone. Ozone (O_3) is a gas present in both the upper stratosphere, where it shields the Earth from harmful levels of ultraviolet radiation, and at lower concentrations in the troposphere, the air closest to the Earth's surface, where it forms through chemical reactions between pollutants from vehicles, factories, fossil fuels combustion, evaporation of paints and many other sources. Key pollutants involved in ozone formation are hydrocarbon and nitrous oxide gases (CARB 2008). Sunlight and hot weather cause the ground-level ozone to form in harmful concentrations and is the main component of anthropogenic photochemical "smog" (USEPA 2008).

Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities.

Fluorinated Gases. Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). These gases are emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases (USEPA 2008).

The Placer County Air Pollution Control District has adopted thresholds for GHG emissions. These include a De Minimis level for operations of 1,100 metric tons of CO_2e per year, 10,000 metric tons of CO_2e per year for the construction and operational phase of projects, and daily thresholds measured in pounds per day (82 lbs/day) for reactive organic gases, oxides of nitrogen, and particulate matter. Each of the thresholds would be the equivalent of a 617 unit single family dwelling project or a 249,1000 square foot commercial building.

TRPA regulates greenhouse gas emissions through a number of standards and programs, including: Mobility 2035, Lake Tahoe Regional Transportation Plan, the 2017 Lake Tahoe Regional Transportation Plan Update, the Lake Tahoe Sustainable Communities Program, and Best Construction Practices Policy for Construction Emissions.

These policies and programs establish goals for greenhouse gas emissions that can be met through transportation management, energy efficiency improvements in structures, and best management practices.

3.9.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP control and removal activities, and therefore, would result in no direct or indirect effects to GHGs or climate change.

3.9.3 Environmental Impacts of the Proposed Alternative

Table 3.9-1: Greenhouse Gas Emissions

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.9-1. Greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? (CEQA VIIIa)			X	
3.9-2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? (CEQA VIIIb)			X	
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.9-3. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally? (TRPA 2d)				X
3.9-4. Increased use of diesel fuel? (TRPA 2e)				X

Discussion

3.9-1. Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? (CEQA VIIIa)

Less than Significant Impact. The Project would not significantly contribute to greenhouse gas emissions because of the nature of treatment and removal activities. During implementation at control sites, greenhouse gas emissions would occur on a temporary and intermittent basis from equipment used in Project activities. Delivery vehicles, dredging equipment, boat motors, pumps, and air compressors could contribute to a small, temporary increase in CO_2 and N_2O levels, both of which are components of GHG. Each control site would include vehicle trips for worker and material delivery, truck trips for moving plants from the treatment to their disposal site, and in some case, generators to run pumps necessary for the removal of plants from the water column. The limited use of boats, pumps, dredgers, and vehicles, and the temporary nature of this activity, would result in a less than significant impact on the generation of GHG emissions. Under most control methods, the GHG generating activity would occur for a brief period, ranging from a few days to weeks, each year. With the exception of benthic barriers left in overwinter, treatment activities would be limited to a few months within the year, further reducing the overall potential to emit measurable quantities of GHG emissions. Under the worst case scenario (dredging), a dredge bucket excavator and collection barge, along with offsite hauling and personnel vehicle trips, would operate for up to eight hours over the course of a week, which would be equivalent or less than an average infrastructure improvement project, and would be far below the GHG emissions impact threshold. For reference, a 300 horsepower diesel excavator operating for 8 hours a day over a 15 day period would produce approximately 21 tons of CO_2e emissions (FEMA 2013), which is well below the threshold, even with combined emissions from dump trucks, water trucks, or other equipment. Therefore, no significant impact would occur. Even if multiple control sites were dredged concurrently, the daily threshold limits would not be met, although it should be noted that a multi-site dredging scenario is not anticipated. A combination of different control methods may occur concurrently in the Project Area, but negligible to low levels of cumulative emissions would be produced, particularly if no dredging is occurring. Idling restrictions in **MITIGATION MEASURE AQ-1** would further reduce GHG emissions levels.

Indirectly during operations, GHG emissions would occur from vehicles accessing the control sites. Under average treatment, limited CO_2 emissions are anticipated from two small generators, one small watercraft, two light trucks and vehicles of up to four workers commuting to and from the Project Area. In comparison with CARB estimates for annual CO_2 emissions with the worst-case scenario of up to 10 daily trips associated with Project implementation at individual control sites, the contribution of the Project towards statewide GHG emissions is very small and results in a small fraction of the individual and cumulative threshold limit.

3.9-2. Would the Project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? (CEQA VIIIb)

Less than Significant Impact. Project activities would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs because such plans specific to the Project Area and vicinity do not exist. Over the long-term, the Project will support State of California plans, policies, and regulations to reduce GHG emissions and adapt Project actions to evolving legislation and best science.

3.9-3. Would the Project result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally? (TRPA 2d)

No. The Project uses a variety of control methods depending on the location of the control site and site characteristics. Control activities would occur at each site for a short period of time, a few days to no more than a few weeks. Benthic barriers would be left in place over a longer period of time, but require no energy consumption or cause emissions outside of the brief installation and removal activity periods. Aeration systems would be operated for longer periods, consuming electrical energy to run the air compressors; however, relatively small quantities of energy consumed would be consumed and no considerable amount of GHG emissions would be produced that would contribute to a regional change in climate. GHG emissions associated with the Project would be too small to have a meaningful contribution toward climate alteration.

3.9-4. Would the Project result in increased use of diesel fuel? (TRPA 2e)

No. A temporary increase in diesel fuel may occur if dredging occurs; however, use of fuel would be limited to the brief period of dredging activity. Likewise, control methods that rely on motorized watercraft may also use small amounts of diesel fuel. In all cases, use of diesel fuel would be temporary and would not require the use of significant quantities. If not treated, infestations will spread and the amount of fuel needed to control the infestations will increase. Therefore, early detection and treatment may consume some quantities of diesel fuel for implementation, but will prevent future scenarios in which larger quantities of fuel are needed to effectively treat denser and more widespread infestations.

3.9.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Greenhouse gas emissions impacts are evaluated in terms of NEPA Intensity Factors 1, 2, and 7.

Issue - Production of Greenhouse Gas Emissions

Direct and Indirect Effects

As discussed in the analysis above, most of the control methods would produce minor emissions quantities - equivalent to an additional vehicle or motorized boat on the lake. Aeration systems would utilize small quantities of electricity similar to a small pump. Dredging machinery would utilize diesel fuels and would emit GHGs during operation and transport of the machinery to and from the affected marina. However, dredging operations would occur over a short duration of a few days. At most, one or two marinas would utilize dredging to treat AIP in a year, and the project equivalent would be below GHG emissions thresholds. Implementation of the control methods would not conflict with Federal Greenhouse Gas emissions policies or the Forest Plan Direction, would not harm public health, and would enact strategies to manage climate change by maintaining the natural habitat through removal of invasive plant species that can proliferate as a result of climate change.

Cumulative Impacts

The cumulative impacts of the proposed action would be restoration of native, natural aquatic habitat, which would be beneficial. By maintaining native habitat and removing invasive aquatic species, the effects of climate change can be counteracted and lake function, as well as native habitat function, can be stabilized. While use of a GHG emitting excavator to implement dredging control methods would emit GHGs and use of motorized vehicles to access the various control sites around Lake Tahoe would emit GHGs, the amount emitted over the treatment period would not be substantial to cause a cumulative impact. Dredging and use of motorized vehicles will contribute small amounts of GHGs that collectively add to the cumulative volume of GHGs emitted; however, the contribution of the project is too small to be considered cumulatively considerable. Additionally, the benefit of maintaining the natural habitat and native lake species threatened by climate change outweighs the small volume of GHGs emitted by those efforts.

3.9.5 Environmental Commitments and Mitigation Measures

The GHG analysis determines no mitigation measures are necessary.

3.10 HAZARDS AND HAZARDOUS MATERIALS, RISK OF UPSET AND HUMAN HEALTH

3.10.1 Setting

The Project Area includes shorezone and nearshore areas of Lake Tahoe, area marshes, tributaries including the Upper Truckee and Truckee River channels, and staging and access points. Project actions include transporting and deploying plastic bottom barrier material and weights by boat to cover identified locations of invasive plant species, depriving them of light to facilitate their removal; dredging using barge and land-mounted machinery or suction machinery mounted to a boat; use of UVC directional light treatment by boat; hand pulling where divers may place removed plant material of a barge or floating platform for removal and offsite disposal; diver assisted suction operations with machinery mounted on a floating platform; and aeration systems in which an aerating device is placed on the lakebed and air is pumped into the device creating a series of bubbles. Methods such as mechanical or suction dredging or that require the use of a motorized boat also require the use of fuels and oils for machinery operation.

Hazardous Materials. There are no hazardous materials cleanup sites listed by the California Department of Toxic Substance Control (DTSC) in or near the Project Area (DTSC 2019). Review of the NDEP Site Cleanup Database reveals some leaking underground storage tank sites in Zephyr Cove and Incline Village, but none at the proposed action's control sites (NDEP 2019). The types of materials used that could be hazardous include fluids such as motor vehicle and mechanical equipment fuels, oils, and other lubricants. No storage facilities, or other structures or industrial sites that could contain hazardous materials are located at the site of the Project.

Airports and Schools. Monitoring and treatment may occur within the vicinity of the Lake Tahoe Airport, including along the taxiway and adjacent to the runway areas. Most schools in the area are greater than ¼ mile from the control site, although a few schools are near ¼ mile from the lake or control site tributaries including, Cold Stream Alternative School, Tahoe Lake Elementary School, Kings Beach Elementary, and Zephyr Cove Elementary.

Fire and Emergency Evacuation Plans. Project activities would occur under the surface of the water and staged from a boat. Some dredging machinery may be located on land adjacent to the water. Various agencies and jurisdictions around Lake Tahoe have established emergency evacuation plans and emergency response procedures, which would continue to be implemented during Project activities.

3.10.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct or indirect hazards or risk to human health.

3.10.3 Environmental Impacts of the Proposed Alternative

Table 3.10-1: Hazards and Hazardous Materials, Risk of Upset and Human Health

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.10-1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? (CEQA IXa)		X		
3.10-2. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? (CEQA IXb)		X		
3.10-3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? (CEQA IXc)			X	

3.10-4. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? (CEQA IXd)				**X**
3.10-5. For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? (CEQA IXe)		**X**		
3.10-6. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? (CEQA IXf)				**X**
3.10-7. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? (CEQA IXg)			**X**	
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.10-8. Involve a risk of an explosion or the release of hazardous substances including, but not limited to, oil, pesticides, chemicals, or radiation in the event of an accident or upset conditions? (TRPA 10a)		**X**		
3.10-9. Involve possible interference with an emergency evacuation plan? (TRPA 10b)				**X**
3.10-10. Creation of any health hazard or potential health hazard (excluding mental health)? (TRPA 17a)				**X**
3.910-11. Exposure of people to potential health hazards? (TRPA 17b)				**X**

Discussion

3.10-1. Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? (CEQA IXa)

Less than Significant with Mitigation Measures. Project activities could require the use of certain hazardous materials, such as fuels, oils, lubricants or other fluids associated with the operation and maintenance of boats, pumps, dredging machinery, air compressors, and barges. Generally, these materials would be contained within vessels engineered for safe storage or within mechanical equipment rooms in the case of air compressors. Large quantities of these materials would not be stored at or transported to the control sites as refueling of large machinery would occur offsite or at marinas where fuel is sold and small equipment fuels or oils would be contained within small hand-held containers appropriate and approved for the storage of such liquids; however, spills, upsets, or other construction related accidents could result in an inadvertent release of fuel or other hazardous substances into the environment. Implementation of **MITIGATION MEASURE HAZMAT-1** and **MITIGATION MEASURE HYDRO-1** will reduce the potential for adverse impacts from these incidents to a less than significant level.

Hazardous materials will be transported, stored, and used in accordance with federal, state, and local regulations (e.g., CAA, CWA, Comprehensive Environmental Response, Compensation and Liability Act and the Toxic Substances Control Act). At the local level, fire departments screen inventories of substances and inspect sites, county health department are responsible for reviewing hazardous materials plans and the Air Quality Control Districts evaluate projects for possible toxic emissions and issue permits as necessary.

3.10-2. Would the Project create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment? (CEQA IXb)

Less than Significant with Mitigation Measures. Project RPMs and compliance with federal and state regulations and permit programs avoid and minimize hazards to the public or the environment involving the release of hazardous materials into the environment. The Project operations are not anticipated to result in the creation of health hazards following compliance with health and safety regulations and waste discharge requirements. The Project Applicant is responsible for providing this financial assurance. To minimize potential impact resulting from accidental spills or release, preparation of a Spill Response Plan, which is a required component of construction and operational SWPPPs, is necessary to reduce potential impacts to a level of less than significant (**MITIGATION MEASURE HAZMAT-1**).

3.10-3. Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? (CEQA IXc)

Less than Significant Impact. The Project located near one-quarter mile of an existing school, as listed above; however, treatment in those areas may or may not require the use of machinery that would utilize fuels and oils. The risk of upset would be no greater than the existing risk of a watercraft in the area and no significant impact would occur, particularly given the temporary nature of the activities.

3.10-4. Would the Project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? (CEQA IXd)

No Impact. The Project is not located on a known hazardous waste and substance site. The Project Area is not identified on the Cortese List, which is updated and submitted at least annually to the Secretary of Environmental Protection pursuant to Section 65962.5 (http://www.envirostor.dtsc.ca.gov/public/). No area within a proposed control site is currently restricted or known to have hazardous materials present. No impact.

3.10-5. For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the project area? (CEQA IXe)

Less than Significant with Mitigation Measures. The portion of the Project along the Upper Truckee River near the airport is located within an airport land use plan for the Lake Tahoe Airport. Portions of the potential treatment areas are within the airport grounds, namely adjacent to the runway and taxiway, and fall within each of the Safety Zones, including Zone 1 (runway protection zone) (ESA, 2019). However, annual monitoring is currently the only activity planned and if AIP are identified, treatment efforts would be temporary in nature and places no permanent residences or structures within the airport land use plan. The Project could treat areas within the airport land use plan, but no permanent structures would be created and no temporary activities would occur that would place persons at risk or violate the airport's 2019 Airport Land Use Compatibility Plan (ALUCP). The ALUCP's goals are to protect the airport from encroachment by incompatible uses, safeguard the welfare of inhabitants in the vicinity of the airport, and ensure no structure affect navigable airspace. Resource management activities, including habitat management, are conditionally allowed in each of the ALUCP zones as long as activities are not capable of creating ground fog or bird hazards. Since the tributaries in this area are some distance from the lake and native vegetation may be present, the most likely treatment activities within the ALUCP area would be monitoring and hand pulling, both of which require few personnel and result in no structural installations or use of tall equipment. Under **MITIGATION MEASURE HAZMAT-2**, coordination with the airport would occur prior to accessing the area to ensure personnel safety.

3.10-6. Would the Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? (CEQA IXf)

No Impact. The Project would not impair or interfere with an adopted emergency response plan or emergency evacuation plan because activities could be delayed to respond to emergencies and activities would also be coordinated with the United States Coast Guard to result in a less than significant impact.

3.10-7. Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? (CEQA IXg)

Less than Significant Impact. Work would occur from a boat, barge, or platform, from the shoreline, and under the surface of the water. The Project does not expose people of structures to a significant risk involving wildfires because the Project Area does not contain sufficient vegetation to spread catastrophic wildfire, is not located adjacent to urbanized areas, and does not involve residences.

3.10-8. Will the Project involve a risk of an explosion or the release of hazardous substances including, but not limited to, oil, pesticides, chemicals, or radiation in the event of an accident or upset conditions? (TRPA 10a)

No, with Mitigation. The Project would not utilize pesticides, chemicals, or radiation. Machinery and watercraft would require the use of oils, lubricants, and fuels; however, the quantities of these materials would be no greater than used for general construction equipment or watercraft and the risk of explosion is low. Spills, upsets, or other construction related accidents could result in an inadvertent release of fuel or other hazardous substances into the environment. Implementation of **MITIGATION MEASURE HAZMAT-1** and **MITIGATION MEASURE HYDRO-1** will reduce the potential for adverse impacts from these incidents to a less than significant level.

3.10-9. Will the Project involve possible interference with an emergency evacuation plan? (TRPA 10b)

No. See discussion and analysis for Question 3.10-7 above.

3.10-10. Will the Project result in creation of any health hazard or potential health hazard (excluding mental health)? (TRPA 17a)

No. See discussions and analyses for Questions 3.10-1 through 3.10-4 above.

3.10-11. Will the Project result in exposure of people to potential health hazards? (TRPA 17b)

No. See discussions and analyses for Questions 3.10-1 through 3.10-4 above.

3.10.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. The analysis addresses the impacts in relation to NEPA Intensity Factors 1, 2, and 7.

Issue - Hazardous Materials Risk

Direct and Indirect Effects

As discussed in the analysis above, the proposed action would include activities and actions that rely on machinery and equipment that use fuels and oils, resulting in a minor risk of accidental release. To reduce this risk, **MITIGATION MEASURE HAZMAT-1** is proposed as a resource protection measure to prevent accidental release of these materials and to provide a response plan should a spill occur. Implementation of the mitigation addresses this potential impact.

Cumulative Impacts

The cumulative impacts of the proposed action are a cumulative contribution toward potential accidental spill events in the area simply due to the use of mechanical equipment and motorized vehicles. Other cumulative projects include rafting permits, ferry operations, pier improvements and buoy relocation, roadwork, and ongoing invasive species control actions, some of which include the use of motorized equipment. Implementation of **MITIGATION MEASURE HAZMAT-1** addresses this impact.

3.10.5 Environmental Commitments and Mitigation Measures

The public safety analysis determines that **MITIGATION MEASURE HAZMAT-1** and **MITIGATION MEASURE HAZMAT-2** are necessary to reduce potential impacts from hazardous materials to a level of less than significant.

Mitigation Measure HAZMAT-1: Spill Prevention and Response

1. Prior to the start of project activities, equipment and vehicles shall be clean and serviced. Routine vehicle and equipment checks will be conducted during the project to ensure proper operating conditions and to avoid any leaks.
2. Contaminated residue or other hazardous compounds shall be contained and disposed of outside of the boundaries of the site at a lawfully permitted or authorized site.
3. Boats and barges used in project activities shall have an Emergency Spill Response Plan and clean up kit. **Spill response training shall be required for all personnel operating equipment with the potential to**

spill. Included in the Emergency Spill Response Plan and clean up kit should be enough absorbent material to encircle the largest vessel used for AIP control operations.

Mitigation Measure HAZMAT-2: Airport Safety and Coordination

1. Prior to the start of project activities within the airport property and runway safety zones, coordination with the Lake Tahoe Airport shall occur to determine schedule, disclose activities planned for the portions of the Upper Truckee River within airport property, identify if a right of entry agreement is required, and implement any conditions or measures required by the airport.
2. If implementation of control methods is necessary, obtain a right of entry agreement and associated appropriate insurance as required by the airport prior to treatment implementation.
3. Monitoring and treatment personnel shall notify the airport when they arrive, depart, or are working in the area.
4. Inspections shall be completed on foot and personnel shall not drive around the airport to each monitoring point. Personnel shall schedule vehicle access, if needed, by airport staff.
5. While on the airport property, personnel shall stay off active pavement, wear a reflective vest, and coordinate with airport staff to open gates to gain access to the western side of the Upper Truckee River.
6. In coordination with airport personnel, safety protocol shall be implemented and adhered to at all times when working on airport property.

3.11 HYDROLOGY AND WATER QUALITY

This section presents the analyses for potential project-level impacts on water quality and hydrology of the Lake-Wide AIP Control Project area. The Project area is inclusive of the Lake Tahoe water body, tributary reaches (including the Upper Truckee River, as the largest tributary reach) and marsh areas, and the Lower Truckee River to the TRPA jurisdictional boundary, as illustrated in Figure 1-2 in Section 1. The Tahoe Keys Marina and Tahoe Keys Property Owner Association lagoons are excluded from the Project area, but the reported results of prior and ongoing AIP control actions in the Tahoe Keys have been considered in the body of scientific literature and monitoring and reporting assembled in support of the following analyses of potential project-level effects to water quality and hydrology.

3.11.1 Setting

Sections 1.4 and 1.5 details the general regulatory environment of the Project area and tier from the Lake Tahoe Region Aquatic Invasive Species Management Plan Appendix A: Regulations and Programs (TRPA 2014). The following section 3.11-1 describes the environmental settings, including regulatory, specific to project area hydrology and water quality, as related to AIP control actions.

Climate and Hydrology. The Lake Tahoe Basin is a bowl-shaped watershed, characterized by steep, north/south trending mountain ranges to the east and west, with the Lake Tahoe water body occupying nearly two-fifths of the 505 square mile watershed. The California-Nevada state line divides the Lake Tahoe watershed, Hydrologic Unit 634.00 (Lahontan Water Board 2016) and USGS HUC 18100200, with approximately 75% of the watershed area and 67% of the lake area within California (https://www.dri.edu/cwes/lake-tahoe-watershed). Within the basin, 63 individual watersheds contribute flow to Lake Tahoe. Lake levels are controlled at the dam in Tahoe City, California, representing the single outlet to the Lower Truckee River. The largest tributary to Lake Tahoe is the Upper Truckee River. As a result of Lake Tahoe's large surface area (22 miles by 12 miles), moderately high elevation of 6,223 feet and great depth (1,645 feet), the hydraulic residence time is around 650 years, meaning that surface and ground waters entering the lake take, on average, 650 years to leave the lake water body (DRI 2019).

Drainage systems surrounding Lake Tahoe convey surface and subsurface runoff from rain and melting snow that slowly erodes the land. Sediment, dissolved minerals, organic litter, and nutrients are transported through the drainage courses and SEZs to the lake. Delta marshes of tributary streams filter these sediments and nutrients whereby they are used for plant growth. Organic materials are decomposed in the oxygen-rich lake and stream waters and nutrients are used by aquatic biota. Suspended sediment can cause turbidity and result in sedimentation and suspended and dissolved nutrients can stimulate algal and AIP growth, depleting the lake of oxygen in the natural process of eutrophication (i.e., increase of organic materials/biomass and depletion of oxygen over time). Today significant portions of the Lake Tahoe Basin are developed, with Factors such as land disturbance, habitat destruction, air pollution, soil erosion, and roads that are associated with development can interact to degrade water quality (Murphy and Knopp 2000). Past development actions and land use management have degraded some sensitive habitat while other habitats have been less affected. In addition to habitat degradation, non-native species and invasive species introductions have drastically altered some terrestrial and aquatic habitats (LTBMU 2016).

Although water quality in Lake Tahoe and its tributaries can be adversely affected by runoff from surrounding lands, Lake Tahoe is still characterized as an oligotrophic, sub alpine lake with low concentrations of nutrients, low algal productivity, and high oxygen concentrations. These factors contribute towards Lake Tahoe's exceptional clarity and its recognition as an Outstanding National Resource Water by the USEPA's Water Quality Standards Program. However, since first measured in 1968, water clarity has significantly declined (Wittmann et al. 2015). The Tahoe State of the Lake Report 2019 (UC Davis 2019) indicates improvements in lake clarity during winter months in recent years; however, summer lake clarity continues to decline, largely offsetting gains made in winter clarity. UC Davis (2019) states that future climate change predictions indicate accelerated warming and earlier spring runoff periods from streams and continued summer lake clarity decline.b The Tahoe Climate Information Management System (TahoeClim; https://tahoeclim.dri.edu/), a joint collaboration between the DRI and UC Davis, provides access to climatological and meteorological data in and around the Lake Tahoe Basin, and can be used to access data for specific AIP infestation areas as AIP control projects are developed.

Robert Coats et al published Climate change in the Tahoe Basin: regional trends, impacts and drivers (2010), a study that quantified decadal-scale time trends in air temperature, precipitation phase and intensity, spring snowmelt timing, and lake temperature in the Lake Tahoe Basin. The results indicate strong upward trends in air temperature, a shift from snow to rain precipitation regime, a shift in snowmelt timing to earlier dates, increased rainfall intensity, increased inter-annual variability and continued increases in temperature of Lake Tahoe. The study concludes that continued warming in the Lake Tahoe Basin has important implications for efforts to manage biodiversity and maintain clarity of the lake.

Lake Tahoe is characterized as an ice free warm-monomictic lake with deep mixing occurring only in the winter, complete mixing occurring on average once every 3 to 4 years and a stable thermocline established at a depth of approximately 20 meters during summer months (TERC 2008). Results published by Sahoo et al. (2013) for the Lake Clarity Model (LCM) report that Lake Tahoe will likely cease to mix to the lake bottom after 2060 for one of the simulated climate regimes with the most common annual mixing depth decreased to less than 200 meters. Decreased mixing depths will reduce dissolved oxygen replenishment, which could result in the release soluble reactive phosphorus and ammonium-nitrogen, both biostimulatory, being released from deep sediments. Results of one simulated climate regime suggest that climate change will reduce lake levels to below the natural rim elevation after the year 2085, directly impacting nearshore characteristics.

As noted in Shaw D. et al. (2017), potential impacts from AIP infestations include: localized degradation in water quality due to increased transfer of sediment-bound nutrients into the water column through plant root uptake and subsequent plant senescence; sediment accumulation and substrate alteration allowing further expansion of the infestation; changes in habitat conditions that favor non-native fish such as catfish and bass, and nuisance algae;

adverse swimming conditions and negative impacts on recreational boating; increasing amounts of plant material washing up and fouling beaches; and the increased potential spread of invasive plants to other areas in Emerald Bay and Lake Tahoe (Eiswerth et al. 2000). Many of these potential impacts could be more substantial in bays and marinas as compared to the greater Lake Tahoe water body because of the seasonally high recreational use, relatively smaller size, and a more enclosed surface water condition.

Non-native species have been intentionally and unintentionally introduced to the Lake Tahoe Region over the last 150 years. AIP can have a range of impacts once they have become established, from a benign presence to disruption of the biological and limnological character of the waterbody (Schladow 2018). AIP infestations are known to occur within the nearshore environment of the greater shorezone of Lake Tahoe, with the body of scientific literature supporting the hypothesis that presence of AIP increases nutrients available for primary productivity and negatively impacts nearshore water clarity. Infestations have also been documented within stream channels tributary to Lake Tahoe, with risk of AIP infestation also associated with wet meadow and marsh ecosystems adjacent to tributary channels. Although there are varying definitions for what is termed the nearshore, the TRPA Regional Plan (2012) defines the nearshore as: "the zone extending from the low water elevation of Lake Tahoe (6,223.0 feet Lake Tahoe Datum) to a lake bottom elevation of 6,193.0 Feet Lake Tahoe Datum, but in any case, a minimum lateral distance of 350 feet measured from the shoreline".

The nearshore of Lake Tahoe is an increasingly important area of focus for managers in the region with the control of AIP surfacing as a top priority of regulatory agencies around 2008, following the discovery of EWM infestations in Emerald Bay. Residents and visitors most often interact with the nearshore of the lake and continue to provide anecdotal reports of change in visible conditions (TRPA 2016). In 2012, the TRPA Governing Board adopted two new standards related to the nearshore environment that address attached algae (periphyton) and aquatic invasive species. DRI, UC Davis, and UNR released the Lake Tahoe Nearshore Evaluation and Monitoring Framework Report in 2013 (Heyvaert et. al. 2013), a report that presents a conceptual understanding of nearshore environmental processes, highlights the heterogeneous nature of the nearshore, identifies data deficiencies that must be addressed to better characterize the environmental status of the nearshore. The report also proposed a set of monitoring metrics and indicated that the actions implemented by partners in the region to improve pelagic water quality are likely to benefit nearshore conditions. AIP control in the nearshore is considered important for the following reasons (Lake Tahoe Nearshore Science Team 2013):

- The nearshore water clarity of the lake is most obvious to viewers onshore.
- The nearshore is where most people interact and experience the lake firsthand.
- Most sediments, nutrients and materials entering the lake that reduce clarity, enter and pass through the nearshore zone.
- The nearshore responds to terrestrial disturbance and may show early localized signs of degradation.
- The nearshore will respond first to onshore management strategies.

<u>Lotic and Lentic Systems.</u> AIP infestations have been documented within stream channels tributary to Lake Tahoe, with risk of AIP infestation also associated with wet meadow and marsh ecosystems adjacent to tributary channels. The roots of AIP can trap fine sediment particles causing sediment loading, which can be detrimental to native species and increase stream turbidity. Additionally, AIP can interfere with recreational use in streams and rivers, such as rafting, swimming and fishing, leading to the determination that certain plant species are nuisance weeds (Schladow 2018). Infestation of AIP, specifically EWM, into a waterbody, including flowing water ecosystems (i.e., lotic systems), can have profound impacts on aquatic ecosystems and the human use of those ecosystems (Smith and Barko 1990). Dense monoculture beds of EWM offer poor habitat for aquatic fauna, as well as interfere with recreational activities. High annual turnover of AIP biomass increases decomposition rates and loading of nutrients into the water column, which may adversely affect localized and downstream water quality (Kelting D.L. 2007).

Regulatory Environment and Water Quality Standards. The TRPA is the designated area-wide water quality planning agency under Section 208 of the Clean Water Act. In 1988 the States of California and Nevada and the USEPA adopted the TRPA Water Quality Management Plan for the Lake Tahoe Basin (TRPA 1988), commonly referred to as the 208 Plan. The 208 Plan, as amended by the TRPA 2012 Regional Plan Update and currently known as the Lake Tahoe Water Quality Management Plan, identifies water quality problems, proposes solutions or mitigation measures, identifies those entities responsible for implementing solutions, and determines agencies or jurisdictions responsible for enforcement. The TRPA Threshold Standards and State of California water quality objectives (WQOs) establish over 30 separate water quality standards for Lake Tahoe and its tributaries. The standards address algal growth potential, aquatic invasive species, plankton count, clarity, turbidity, phytoplankton productivity, phytoplankton biomass, zooplankton biomass, periphyton biomass, dissolved inorganic nitrogen loading, nutrient loading in general, tributary water quality, surface runoff quality, and the quality of other lakes in the Lake Tahoe Basin.

Regional water quality standards are outlined in the TRPA Code Chapter 60. The chapter sets forth standards for the discharge of runoff water from parcels, and regulates the discharge of domestic, municipal, or industrial wastewaters, which are periodically assessed to document status and trends in Lake Tahoe. TRPA water quality thresholds for littoral Lake Tahoe apply to nearshore areas. The standards and prohibitions apply to discharges to both surface and ground waters. In 2012, the TRPA Governing Board adopted new standards related to the nearshore environment to address attached algae (periphyton) and aquatic invasive species. There are no applicable state or federal turbidity standards specifically for the nearshore. TRPA applies a nearshore turbidity standard to: "*decrease sediment load as required to attain turbidity values not to exceed three nephelometric turbidity units (NTU). In addition, turbidity shall not exceed one NTU in shallow waters of the lake not directly influenced by stream discharges.*"

Chapter 4 of the most recent Threshold Evaluation Report (TRPA 2016) presents an evaluation of the water quality conditions and trends for the Region's aquatic system relative adopted standards and stresses that the health of the Region's aquatic system is intimately linked to many of the components of the terrestrial system. The extent of impervious surfaces (soils chapter), the status vegetation and riparian areas (vegetation chapter), the condition of Region's streams (fisheries chapter), and atmospheric deposition of nitrogen (air quality chapter) all strongly influence the pollutant load reaching the littoral and pelagic lake environments. TRPA has a management standard to "*prevent the introduction of new aquatic invasive species into the Region's waters and reduce the abundance and distribution of known aquatic invasive species. Abate harmful ecological, economic, social and public health impacts resulting from aquatic invasive species*". This most recent threshold evaluation indicates little to no change in the number of new aquatic invasive species/aerial extent of distribution and close to 40-acres of AIP control conducted as of 2015, but notes insufficient data to determine status/no target established.

Lahontan is one of the nine Regional Water Quality Control Boards (Water Boards) in California. The nine Water Boards maintain Basin Plans that include comprehensive lists of water bodies in each plan area, as well as detailed language about the components of applicable water quality objectives. The federal CWA gives states the primary responsibility for protecting and restoring surface water quality.

The Basin Plan was adopted in 1995 and amended in 2016. Specifically Chapter 5, Water Quality Standards and Control Measures for the Lake Tahoe Basin, designates beneficial uses for the surface waters of the Lake Tahoe and Truckee River Hydrologic Units. The Basin Plan outlines the narrative and numeric WQOs for water bodies within these hydrologic units. Section 5.2 of the Basin Plan contains the waste discharge prohibitions, including the waste discharge prohibitions on discharges to floodplains and SEZs.

The Total Maximum Daily Load (TMDL) Program addresses impaired waters of the Region and satisfies CWA Section 303 and 305 requirements. For California waterbodies, Lahontan TMDL staff evaluate waterbody data to determine if water quality objectives are met or are being exceeded. There are twelve CWA Section 303(d) listed waterbodies within the Lake Tahoe Hydrologic Unit, including the Upper Truckee River and Lake Tahoe itself.

Pollutants impacting the listed water bodies include nutrients, sediment, iron, chloride, and pathogens. There are five listed waterbodies in the Truckee River HU, including the Truckee River itself. Pollutants impacting the listed water bodies include sediment and priority organics (Tahoe RCD 2018). Lahontan and NDEP collaborated to develop the Lake Tahoe TMDL, which was approved by USEPA in August 2011. The Lake Tahoe TMDL Program is now in the implementation and tracking phase, with controls being implemented to reduce pollutant loading to Lake Tahoe, including control of AIP introductions and infestations.

As authorized by the USEPA, the State Water Resources Control Board and nine Water Boards also implement the Section 402 CWA NPDES and CWA Section 401 Water Quality Certification (WQC) programs and requirements. The Section 401 WQC relates to State certification of federal permits, including those issued by USACE under CWA Section 404, which establishes the program to regulate the discharge of dredge or fill material into waters of the United States. Specific to the Project, Board Order R6T-2016-0018, as amended or superseded, authorizes AIP control actions under CWA Section 401 and a Basin Plan prohibition exemption. In addition, the Lahontan regulates waste discharges under the California Water Code, Article 4 (Waste Discharge Requirements) and Chapter 5.5 (Compliance with the Provisions of the Federal Water Pollution Control Act, as Amended in 1972).

The Lahontan must consider anti-degradation pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16 to find that the subject discharges are consistent with the provisions of these policies. Anti-degradation findings that are consistent with the policies are necessary for reissuance of waste discharge requirements for operations and actions within the project area.

The CDFW final LSA/SAA, Notification No 1600-2014-0082-R2, as amended, formalizes the agreement for AIP control actions conducted for routine maintenance of the functional and structural integrity of aquatic resources within Lake Tahoe and the Truckee River, between the dam at Lake Tahoe to River Ranch at Alpine Meadows Road.

NDEP's Bureau of Water Quality Planning (BWQP) is responsible for several water quality protection functions which include collecting and analyzing water data, developing standards for surface waters, publishing informational reports, providing water quality education and implementing programs to address surface water quality. The Lake Tahoe Watershed Program is the NDEP program collaborating with Lahontan to protect Lake Tahoe as a water of extraordinary aesthetic or ecologic value. For segments of Lake Tahoe in Carson City, Douglas and Washoe Counties, NAC 445A.1626 and 445A.1626 outline the water control limits applicable to Lake Tahoe and Lake Tahoe Tributaries, respectively. CWA Section 401 WQC is required for AIP control actions authorized by NWP 27. Additionally, Working in Waterways approval would be applicable for certain AIP control actions in Nevada.

Depending on the elevation range of AIP control sites, application for authorization of use of state-owned public rights-of-ways, including submerged lands, may be required by CADSL and NVDSL.

3.11.2 Environmental Impacts of the No Action Alternative

The No Action Alternative serves as a baseline condition against which the Proposed Project Alternative is compared for determination of potential direct, indirect and cumulative effects. The No Action Alternative represents the foreseeable future in Lake Tahoe without the Project conditions. Therefore, the No Action Alternative would result in no additional AIP control methods used within the 2014 Lake-wide AIP Control Project area, and the existing habitat and water quality where AIP infestations occur would not be restored.

The No Action Alternative implements no additional AIP control activities, and therefore, would result in no direct effects to hydrology and water quality. Indirect effects of the No Action alternative are expected to include a continued decline in the light levels throughout the water column and decreased quality of aquatic habitat by altering nutrient cycles and food webs, contributing to algal bloom potential and phytoplankton populations, outcompeting native aquatic plant species, harboring target invasive warm water fish, and inhibiting recreation. As noted in the AIS Management Plan (TRPA 2014), the potential economic impact to the Lake Tahoe Region caused by expansion of existing infestations or new AIS introductions could be substantial. The continued spread of AIP may result in increasing impacts to water temperature, nearshore water clarity as a result of fine organic sediments associated with plant decay, dispersal of weed fragments, nearshore pH within some locations, and potentially changes to dissolved oxygen, total phosphorous, and total nitrogen.

3.11.3 Environmental Impacts of the Proposed Project Alternative

Table 3.11-1 identifies the applicable checklist item, anticipated level of impact, and if mitigation measures will be required to reduce an identified potential impact to a level of less than significant.

Table 3.11-1: Hydrology and Water Quality

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.11-1. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? (CEQA Xa)		**X**		
3.11-2. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? (CEQA Xb)				**X**
3.11-3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would i) Result in substantial erosion or siltation on- or off-site; ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or			**X (iii)**	**X (i, ii, iv)**

iv) Impede or redirect flood flows? (CEQA Xc)				
3.11-4. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? (CEQA Xd)				X
3.11-5. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? (CEQA Xe)		X		

TRPA Initial Environmental Checklist Item	Yes	No, With Mitigation	Data Insufficient	No
3.10-6. Changes in currents, or the course or direction of water movements? (TRPA 3a)				X
3.11-7. Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20 yr. 1 hr. storm runoff (approximately 1 inch per hour) cannot be contained on the site? (TRPA 3b)				X
3.11-8. Alterations to the course or flow of 100-year flood waters? (TRPA 3c)				X
3.11-9. Change in the amount of surface water in any water body? (TRPA 3d)				X
3.11-10. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity? (TRPA 3e)		X		
3.11-11. Alteration of the direction or rate of flow of ground water? (TRPA 3f)				X
3.11-12. Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations? (TRPA 3g)				X
3.11-13. Substantial reduction in the amount of water otherwise available for public water supplies? (TRPA 3h)				X
3.11-14. Exposure of people or property to water related hazards such as flooding and/or wave action				X

from 100-year storm occurrence or seiches? (TRPA 3i)				
3.11-15. The potential discharge of contaminants to the groundwater or any alteration of groundwater quality? (TRPA 3j)		X		
3.11-16. Is the Project located within 600 feet of a drinking water source? (TRPA 3k)		X		

Discussion

3.11-1. Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? (CEQA Xa)

<u>Less than Significant with Mitigation Measures.</u> Failure to implement effective, reasonable and appropriate measures to protect water quality and/or non-compliance with WQOs, waste discharge requirements and CWA Section 401 WQC, as well as the general and regional conditions of USACE CWA Section 404 NWPs, would constitute a significant impact to water quality and beneficial uses. TRPA Code Chapter 60, Lake Tahoe Water Quality Management Plan (208 Plan), Lahontan Basin Plan Chapter 5, and specific to Nevada, NAC Chapter 445A.1626 (Lake Tahoe) and 445A.1628 (Lake Tahoe Tributaries) disclose the applicable codified regulations and narrative and quantitative WQOs. Table A-3 in Appendix A summarizes, by AIP control method, potential impacts to beneficial uses assigned to the Lake Tahoe water body and tributaries. Generally potential impacts that are considered adverse could occur over the short-term (i.e., temporary) and as AIP infestations are controlled and plant densities decreased would diminish over the long-term. Cumulative effects of AIP removal and control would be considered beneficial to water quality and hydrology, as supported by federal, state, and regional laws, statues and policies directing general AIS management and the growing body of scientific literature.

Water Quality

The following analysis of the Project's potential to impact water quality and beneficial uses is presented by individual AIP control method. When a potential impact may vary according to specific location within the Project area, effects of the AIP control method to the lake body, tributaries or marshlands are further described. Appendix A, Table A-3, provides a summary of potential impacts as supported by AIP background documents, reports and studies and published scientific research papers.

<u>Surveillance Monitoring.</u> Surveillance or visual monitoring is a form of assessment that provides program, project and land managers with information to make well-informed management decisions. Routine observation, at the seasonal or annual interval, of known AIP infestations and new infestation areas, allows for prioritization of labor and funding efforts, evaluation of status and temporal trends in population sizes and distributions over time, qualitative judgement of AIP effects on biota and ecosystem processes, and evaluation of effectiveness of control actions. AIP can quickly recolonize areas after control actions: EWM was observed in treatment areas within 30 days after removal of benthic barriers in Lake George in New York (Eichler et al. 1995); and CPW and EWM recolonized the TKPOA West Channel and Tahoe Keys Marina East Channel within two months of AIP removal conducted during maintenance dredging in 2015 (Source: CWA Section 401 WQC Final Reporting).

Implementation of this method is feasible for AIP control in lake water bodies, tributaries, and marsh systems. In the absence of and in addition to monitoring and reporting requirements dictated by regulatory authorizations, the body of scientific literature supports Surveillance as a means for rapid response towards control of re-infested or newly detected AIP populations (Aron et al. 2010; Kelting 2015; CDFG 2008; TERC 2018; DeBruyckere 2019).

Led by the League to Save Lake Tahoe (League), "Eyes on the Lake" is a citizen science program, designed to report the incidence of AIP in Tahoe's waters. League staff train community members how to identify and report the location and presence of aquatic plants in the lake. The "Tahoe Keepers" self-inspection and decontamination training program provides paddle-craft users with the information and training to help prevent the introduction and spread of AIS from non-motorized watercraft. Since the program's inception over 3,000 people have self-certified through the online education program. Another League-managed program is "Pipe Keepers," a community-based volunteer monitoring program that examines stormwater entering Lake Tahoe and its tributaries.

Surveillance creates no direct or indirect short-term or long-term adverse effects to water quality, and would not result in a violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Cumulative effects of Surveillance would be beneficial towards the continued identification of AIP species and infestations and also the effectiveness of physical control actions. Surveillance would result in no impacts to water quality and beneficial uses. Continuation of current surveillance monitoring and implementation of new visual monitoring programs would require no specific regulatory authorizations or mitigations.

<u>Hand Removal.</u> Hand removal involves manual removal of plant bodies from bed substrates and skimming of plant fragments from a water surface or water column. Minor bed disturbance may occur depending on control site conditions, but such disturbance would have only minor short-term effect to water clarity in a discrete location.

In the lake water body, hand removal actions can create minor short-term, isolated effects to water clarity that would be significantly less than the effects of wave action, stream velocity, and bed material entrainment and upwelling that are created by lake weather patterns.

In stream courses, hand removal actions would mimic the bed disturbance regime described for the lake body. Discrete areas of stream bed substrates would be temporarily disturbed during implementation, but bed disturbance and the potential for sediment entrainment would be minor, as compared to bankfull flows (i.e., channel forming flows), and would not persist.

In marsh systems, hand removal actions would result in little to no impact to surface water quality as a result of typical conditions when site access is possible. Soil materials disturbed during AIP removal would have little opportunity to move off-site as a result of a shallow to absent water column and little to no surface water flows.

Monitoring of completed and on-going Hand Removal projects reports no long-term adverse change to turbidity or water clarity. As Hand Removal creates no direct or indirect long-term adverse effects to water quality, such control actions would not result in a violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Cumulative effects of Hand Removal actions would be beneficial, allowing for re-establishment and spread of native plant populations and improvement of habitat quality over time. Hand removal actions would result in temporary and less than significant impacts to water quality and beneficial uses. Continuation of on-going hand removal projects and implementation of future hand removal actions would require no specific regulatory authorizations or mitigations.

<u>LFA Systems.</u> LFA system designs are variable, as dictated by site conditions, but serve to initiate laminar flow inversion and oxygenation to improve water and sediment quality and potentially reduce AIP growth. LFAs constituents commonly affected by aeration include: volatile organic chemicals; ammonia, chloride, carbon dioxide, hydrogen sulfide, methane, iron and manganese (Minnesota Rural Water Association 2009). The system itself does not heat or cool the water column. Implementation of this control method would be feasible for AIP control in lake water bodies, more specifically within marinas and lagoons, and potentially in shorezone areas protected by breakwaters.

Installation of these systems temporarily disturb bed substrates and result in minor, less than significant discharge. Disturbance is minimized by hand placing diffusers and air lines on the marina lake bottom using divers in lieu of heavy equipment. Elevated turbidity is short-term during the installation period, with operation of diffusers generating no long-term elevated turbidity or increases in suspended sediment. Should operations produce discharge, systems can be deactivated to address potential adverse water quality impacts. In 2004, Board Order No R6T-2004-0024-A1, amended the prior authorization for the TKPOA lagoon and marina circulation system to reduce the water quality sampling frequency from weekly to monthly for all parameters except for total kjeldahl nitrogen, total phosphorus, acid soluble aluminum, and fecal coliform during operation of the recirculation system, as based on weekly laboratory results detecting no significant weekly variation in parameter concentrations. In November 2018, the TKPOA application for General 401 WQC Order Requirements and Basin Plan Prohibition Exemption for the Laminar Flow Aeration Trial Project was deemed complete, with TRPA issuing a project permit in early 2019, for installation and operation of the project until October 2021. The intent of the project is to determine if laminar flow inversion and oxygenation will result in improved water and sediment quality **by controlling** ~~and lead to a reduction in~~ AIP growth in the lagoons **through the reduction in lake bottom sediments (TRPA Hearings Officer Memorandum December 6, 2018).** Again routine water quality, sediment and vegetation monitoring will be conducted for three years to evaluate system effects to the 4-acre project area.

More recent monitoring results, for the LFA installed at Ski Run Marina in 2018, report reductions in ammonia, total kjeldahl nitrogen, **and** total organic carbon **in sediments,** and **a reduction in** muck thickness (i.e., organic materials on marina lake bed) one year into operations, as compared to pre-project levels **measured at five sampling points in the marina** and the **background** ~~control~~ site**, which is located outside of the marina at the extent of the existing pier and outside of LFA influence**. This **reduction in concentration of measured sediment quality constituents** ~~improvement in overall water quality~~ in the Ski Run Marina is coupled by a reduction in total plant cover ~~ranging from 38 percent to 45 percent~~ (presentation by Harold Singer; Nearshore Aquatic Weed Working Group [NAWWG] quarterly meeting held November 6, 2019). ~~Although there is a clear reduction in organic carbon and muck thickness, finds are unclear as to whether the LFA initiated conversion and respiration of carbon or resulted in transport and redistribution of organic materials from the southern portion to the northern third of the marina, the control site).~~ **Water quality parameters (i.e., ammonia, total kjeldahl nitrogen and nitrate-nitrite) were measured pre-project on July 31, 2018 and on August 21, 2019 during the first year of operation, with turbidity and pH field measured more frequently. No degradation in water quality, as measured by these parameters is reported. The Ski Run Marina LFA project report released January 2020 (Singer 2020), reports the following for the first year results:**

- **Aquatic plant cover was reduced in the middle of Ski Run Marina from 63% to 18% and in the back portion of the marina from 42% to 1%.**
- **No change in pH was observed.**
- **No hydrogen sulfide odors were detected.**
- **No change in orthophosphate was detected.**
- **Ammonia levels in the sediment were reduced by a minimum of 27% to up to 93%.**
- **Total kjeldahl nitrogen levels in sediment were reduced by a minimum of 7% to up to 94%.**
- **Total organic carbon levels increased by 3% at one station and decreased by between 27% and 87% at the other four stations.**
- **The muck layer was reduced by between 5 inches to 23 inches.**

Although the Tahoe Keys lagoons are outside the lake-wide project area, preliminary results are considered towards LFA effectiveness testing. Monitoring results indicate that the TKPOA LFA installed in a portion of the lagoon system is most effective in open water areas **of the lagoons** with a depth range of 11 to 15 feet (presentation by Greg Hoover, Water Quality Manager for the Tahoe Keys Property Owners Association; NAWWG quarterly meeting on November 6, 2019). The LFA is suspected initiation of cyanobacteria blooms occurred in nearby portions of deadend lagoons and dense coontail populations growing in concentric circles around some aeration apparatuses. TKPOA monitoring of LFA system effects is ongoing. Additionally, TKPOA monitoring programs continue to assess sources and effects of anthropogenic inputs, environmental variables specific to the Tahoe Key marinas, cannels and lagoons, the suite of AIP control methods historically implemented, pilot testing of UV-C Light, and the potential use of herbicide applications.

LFA systems are currently authorized under NWP 5, Scientific Measurement Devices, the associated CWA Section 404/401 regional and project-specific conditions, the CDFW LSA/SAA agreement for routine maintenance, and TRPA project permits. Additionally, in Nevada, the conditions of the Working in Waterways approval would also apply, and when dictated by the elevation of a specific treatment area, conditions of CDSL lease agreements or NVDSL management license would also apply. Cumulative effects of this AIP control action, when used as a pre-project tool or in conjunction with direct control methods, are anticipated to benefit general habitat quality through improved water quality and reduction of accumulated organic materials. Through compliance with CWA Section 404/401 regional and project-specific conditions the CDFW LSA/SAA agreement for routine maintenance and TRPA permit conditions, LFA systems would result in less than significant impacts to water quality and beneficial uses. Through implementation of **MITIGATION MEASURE HYDRO-1**, potential impacts to water quality and beneficial uses from continuation of current projects and implementation of future LFA systems would be reduced to a level of less than significant.

Diver-Assisted Suction Removal. Diver-assisted suction removal to control AIP is accomplished with trained divers selectively removing the plant body, including the root system, by hand and transferring materials for disposal via suction hose and by hand to a catchment basket or similar. Implementation can create minor disturbance to bed substrates and result in short-term, localized effect to water clarity as a result of elevated turbidity from the entrainment of organic materials and bed substrates, mitigation for which is described below. Monitoring results from previously completed and on-going AIS control projects in the Lake Tahoe Region report that elevated turbidity levels are temporary and localized in nature (CDPR 2012; Tahoe RCD 2017; Tahoe RCD 2018) and indicate no long-term adverse effect to water quality of the lake water body or stream course. In Lake George in New York, one-year post-treatment of AIP at sites using diver-assisted suction removal showed a greater number of native species with a substantial reduction in EWM biomass and improved water quality (Boylen, C. W. et al. 1996).

AIP control by diver-assisted suction removal is currently authorized under NWP 27 (Aquatic Habitat Restoration, Enhancement and Establishment Activities) the associated CWA Section 404/401 regional and project-specific conditions, CDFW LSA/SAA agreement for routine maintenance and TRPA permit conditions. Additionally, in Nevada, the conditions of the Working in Waterways approval would also apply. Cumulative effects of this AIP control action would beneficially impact habitat quality through selective removal of AIP and a reduction of AIP biomass and the coupled release of nutrients to the water body during seasonal die-off, which when unaddressed can cause algal growth and related water quality degradation. Through compliance with CWA Section 404/401 regional and project-specific conditions, CDFW LSA/SAA agreement for routine maintenance (or in Nevada, Working in Waterways permit conditions) and TRPA permit conditions, diver-assisted suction removal actions would result in less than significant impacts to water quality and beneficial uses. Through implementation of **MITIGATION MEASURE HYDRO-1**, potential impacts to water quality and beneficial uses from diver-assisted suction removal would be reduced to a level of less than significant. Implementation of **MITIGATION MEASURE HAZ MAT-1**, which requires spill prevention and response, would reduce the risk of new pollutants and contaminants entering the surface waters when diver-assisted suction removal utilizes motorized vessels.

Benthic Barriers. Benthic barriers or "bottom barrier" treatment consists of placing sections of gas permeable, black landscape cloth, plastic, jute, or other material, over the top of submerged vegetation to exclude light. The barriers can range in size, with the size of the barrier dependent on the logistics of deploying, retrieving and maneuvering in and out of the water. This control method is typically deployed in high priority areas of dense plant growth. Following barrier placement, diver-assisted hand suction removal is conducted to achieve 99%-100% plant removal at the perimeter of the barriers. Figure 2 in Section 1 illustrates past and on-going AIP control projects, as well as future projects in the planning and design phase. For purposes of this analysis, reporting for control projects implemented in Lake Tahoe at Emerald Bay, Lakeside Marina, Fleur du Lac and the TKPOA lagoons is discussed.

Installation and removal of benthic barriers can temporarily affect water clarity as a result of elevated turbidity from entrainment of organic materials and bed substrates. Barriers can have fine sediment deposited on them during the period of deployment, and this fine sediment, along with decaying plant material, can cause turbidity as the barriers are removed, mitigation for which is described below. Benthic barrier water quality monitoring results for Emerald Bay control projects indicate that turbidity is localized and temporary in nature (CDPR 2012). Local turbidity elevations observed in Lake Tahoe during previous barrier installation, barrier removal, and diver-assisted hand removal activities have ranged from background conditions (0.2 to 0.5 NTU) to short-term elevations as high as 5 to 7 NTU. Average observed increases are between 1.0 and 2.5 NTU and past project actions have not resulted in a sediment plume or sustained turbidity levels greater than 3 NTU (TRPA 2014). Most of the observed elevations in turbidity have resulted due to fine sediments that collect on barrier surfaces during deployment and re-established submerged aquatic plants and are not the result of disturbing bed substrates. Reporting for AIP control projects implemented in 2016 states that turbidity measurements did not exceed 3 NTU, as measured within the 25-foot perimeter of the Lakeside Marina and Fleur du Lac control sites, and measured between 1 and 5 NTU at the Lower Truckee River control site with a single maximum measurement of 21.1 NTU measured during barrier removal (Tahoe RCD 2016).

Long-term and cumulative effects from this control action would beneficially impact habitat quality and water quality through the control and resultant reduction of AIP biomass that can adversely affect dissolved oxygen concentrations and nutrient availability during seasonal die-off. AIP differ significantly in regeneration capacity, and water quality concentrations and nutrient availability do have a potential effect on the regeneration of AIP fragments (Kuntz et al 2014). The duration of employment of benthic barriers is an important factor, as sediment accumulation on barrier surfaces can occur, which can allow for reestablishment of AIP and necessitate follow up or secondary treatment (TKPOA 2018). Over the discrete time period that barriers function to promote AIP die-off, concentrations of dissolved oxygen, biomass, and habitat quality may also be impacted. Indirect effects to water quality occur during die off and decomposition, but would mimic effects to water quality during plant seasonal die-off and decomposition and would not initially differ significantly from baseline conditions. Additively, as plant density and the extent of AIP infestations decrease, decomposition of biomass would also decrease.

If gravel bags become necessary to secure barriers, bed substrate characterization and sediment quality testing would be performed in compliance with CWA Section 401 WQC requirements. Gravel bags are considered fill material when applying for a CWA Section 401 WQC and such fill material should have no more fine sediment particles and nutrients than the lake substrate over which fill would be placed. Degradation of burlap, jute or polymer bags used to contain the sand could impede full recovery of project materials and result in discharge to surface water.

Motorized watercrafts, when used for barrier installation, have the potential to contribute pollutants such as gasoline and oil to the water column through spills, leaks or other releases and to violate water quality standards and waste discharge requirements.

AIP control by benthic barriers is currently authorized NWP 27 (Aquatic Habitat Restoration, Enhancement and Establishment Activities), the associated CWA Section 404/401 regional and project-specific conditions, CDFW LSA/SAA agreement for routine maintenance, and TRPA permit conditions. Additionally, in Nevada, the conditions of the Working in Waterways approval would also apply, and when dictated by the elevation of a specific treatment area, conditions of CDSL lease agreements or NVDSL management license would also apply. Cumulative effects of this AIP control action would beneficially impact habitat quality through reduction of AIP biomass and the coupled release of nutrients to the water body during seasonal die-off, which when unaddressed can cause algal growth and related water quality degradation. Through compliance with CWA Section 404/401 regional and project-specific conditions, CDFW LSA/SAA agreement for routine maintenance (or in Nevada, Working in Waterways permit conditions), and TPRA permit conditions, AIP control by benthic barriers would result in less than significant impacts to water quality and beneficial uses. Through implementation of **MITIGATION MEASURE HYDRO-1**, potential impacts to water quality and beneficial uses from AIP control by benthic barriers would be reduced to a level of less than significant. Implementation of **MITIGATION MEASURE HAZMAT-1**, which requires spill prevention and response, would reduce the risk of new pollutants and contaminants entering the surface waters when motorized vessels are used for installation of benthic barriers.

UV-C Light. The UV-C Light control method controls AIP through the application of ultraviolet-C light, a short wave electromagnetic radiation light that damages the DNA and cellular structure of aquatic plants and their fragments, disrupting the life cycle of the plant. Because of the adaptability of the structural form of the UV-C treatment array, implementation of this method would be feasible for AIP control in lake water bodies, tributaries, and marsh systems (Inventive Resources, Inc.; personal communications November 12, 2019). In laboratory-controlled testing, UV-C Light killed most AIP tested. Plants did not reproduce or regrow, when exposure times of 5 to 15 minutes were used. Some regrowth was observed on plants that dropped or degraded following treatment with lower exposure times. Regrowth was observed to be slow and quickly turned yellow after a second round of treatment.

This emerging technology was field pilot tested at Lakeside Marina and Beach in 2017 with pre-project (2017), immediate post-project (2017) and long-term post-project (2018) results reported in the *Aquatic Invasive Plant Control Pilot Project Final Monitoring Report* (Tahoe RCD 2019). The field pilot testing at the Lakeside treatment areas similarly reflected laboratory results. As illustrated in Figure 2.4.1-3, AIP growth is halted by UV-C Light treatment, plants begin to die-off, lose turgor pressure and drop from the water column over a period of one to two weeks, depending on plant morphology, and then decompose over a time period of weeks to months. The release of nutrients from plant degradation is dependent on the total biomass of an infestation and would not be instantaneous, with decomposition rate driven by a suite of uncontrolled environmental variables specific to a treatment area. As with benthic barriers, UV-C Light promotes AIP die-off and decomposition, and over this discrete time period of weeks to months depending on plant morphology, concentrations of dissolved nutrients, biomass, and habitat and native species may be impacted. Indirect effects to water quality occur during die off and decomposition, generally mimic effects to water quality during plant seasonal die-off and decomposition and would not initially differ significantly from baseline conditions, while overtime plant density and the extent of AIP infestations (i.e., new biomass sources) would decrease.

During field pilot testing, water quality parameters were measured to gauge compliance with the Basin Plan and TRPA Regional Plan water quality objectives. Pre-treatment water quality sampling at the Lakeside Marina and Beach control sites established baseline conditions. Water quality monitoring occurred daily during active UV-C light control between June and September with parameters measured approximately each hour. Third-party QA/QC monitoring occurring weekly. Post-treatment water quality sampling occurred in October 2017 upon completion of active UV-C Light control. Water quality monitoring results reported no instances of violation of narrative or numeric WQOs. Specifically, UV-C Light control created no measurable change during implementation to water temperature, dissolved oxygen concentrations, pH, specific conductivity, total dissolved solids or turbidity, as compared to pre-project baseline concentrations. Because UV-C Light control is applied at the crown of the plant and does not necessitate disturbance of bed substrates, elevated turbidity does not result during implementation.

UVC-Light control uses approximately 1 watt/square inch of the array over a treatment area. Assuming UV-C Light applied over 10 minutes and between 8-inches and 36-inches at the crown of a plant and above lake or stream bed, temporary temperature increase would initially be 0.5 degrees Fahrenheit and with continual mixing of an average 8-foot water column depth, temperature change dilutes to between 0.125 and 0.031 degrees Fahrenheit. In summary, temporary increase in water temperature created by UV-C Light control is comparable to the heat generated from a boat engine. Refer to Appendix A-1 for detailed calculations.

AIP control using UV-C Light would not increase the total nutrients released to a water body, but the timing of the release of nutrients could deviate from seasonal die off that is typically observed during late fall and winter months when weather conditions promote die off and decomposition occurs. When considering potential impacts of a release of nutrients to the water column during the growing season, because plant decomposition following UV-C Light treatment is not instantaneous, potential impacts to water quality are considered less than significant. Furthermore, infestations with dense biomass would require multiple UV-C Light treatments resulting in a longer timescale of degradation and potential release of nutrients to a water body.

Pilot study field observations reported that organic matter on the lake bed or substrate increases in patches but is visibly intermittent and temporary, as materials did not persist with the flossing of matter between the marina site and the open lake. Organic matter associated with the decomposition of AIP in the beach treatment area, dissipated over the course of just a few days to a few weeks, assumedly being carried with the littoral drift.

Individual species inhabiting above the sediment-water interface may be impacted from UV-C Light control, with limited to no impact to flora and fauna that live below the surface, since UV-C Light is rapidly attenuated (decreased penetration) when organic material is present. Increase in organic matter, even for temporary periods, is assumed to facilitate the recovery of BMI and recolonization by providing food sources. Immediate post-treatment results as compared to pre-treatment results, support this assumption with total taxa richness, total abundance, EPT (*Ephemeroptera Plecoptera Trichoptera*) taxa richness and EPT abundance increasing at the Lakeside control sites just a few weeks following UV-C Light treatment. Previous efforts to target invasive clam invertebrates or AIP with alternate treatment and control methods (e.g. suction and benthic barriers) in the open lake neighboring Lakeside Marina also suggest recovery of the BMI community after treatment (Wittmann et. al. 2011).

Under certain environmental conditions in freshwater systems, single celled bacteria, called “cyanobacteria”, can increase rapidly in biomass resulting in a “harmful algal bloom” (HAB) that in some cases can produce toxins. Harmful algal blooms (HABs) and algal toxins have increased globally in geographic range, frequency, duration, and severity in recent years and have been attributed to various anthropogenic factors. The most significant factors include climate change, nutrient loading, and water residence time. HABs are problematic because of effects on beneficial uses such as recreation, aquatic life, and drinking water by reducing aesthetics, lowering dissolved oxygen concentration, causing taste and odor problems, and producing potent toxins (State Water Board 2016). HABs have been observed in recent years in areas of the Lake Tahoe shoreline, but have not been stated to be associated with AIP control actions. The control and removal of AIP does not increase significant factors known to contribute to HABs, but would remove plants from the water column, alter community structure and competition, and potentially allow for rapid growth species to thrive in the absence of plant competition for nutrients and sunlight. The UV-C Light control method does not place fill or create discharge and would be authorized under CWA Section 10 (i.e., change to navigation). Through compliance with CWA Section 10 regional and project-specific conditions and TPRA permit conditions, UV-C Light control actions would result in less than significant impacts to water quality and beneficial uses. Through implementation of **MITIGATION MEASURE HYDRO-1**, potential impacts to water quality and beneficial uses from UV-C Light control would be reduce to a level of less than significant

Motorized watercrafts, when used for UV-C Light control, have the potential to contribute pollutants such as gasoline and oil to the water column through spills, leaks, or other releases and to violate water quality standards and waste discharge requirements. Implementation of **MITIGATION MEASURE HAZMAT-1**, which requires spill prevention and response, would reduce the risk of new pollutants and contaminants entering the surface waters when motorized vessels are used for UV-C Light control.

Suction and Mechanical Dredging. AIP control through site dredging removes the entire plant, including the root system and the associated depth of the bed substrate. Suction dredging involves loosening materials from the bed, and raising the material while suspended in the water through a pipe system connected to a pump. Material can be loosened through different means. Suction alone can be sufficient in loose soils, but water jets may also be used. Suction dredging systems include suction dredgers, cutter suction dredgers that utilize a cutter head to loosed materials, and trailing suction hopper dredgers, which use a drag head on the suction pipe to dislodge materials. While the sediment and plants are removed, the spoil water stays within the containment area or depending on volume, waters would discharge to impoundment basins. Mechanical dredging involves the use of mechanical equipment, such as a long-arm excavator, clam shell excavator, or crane excavator located on the shore or on a barge, to scoop material from the bed, raise it to the surface, and dispose of the material in dump trucks or other containers to be hauled offsite and disposed in a landfill. This method has been used primarily in marina areas in the past to increase or maintain marina depth to maintain navigation and remove buildup of debris, and is able to entirely remove AIP and their root systems. In areas requiring extensive removal, materials may be dewatered onshore prior to removal to a landfill. Due to the volume of spoil water produced, suction dredging may require authorization for effluent discharge to sanitary sewer or storm drain. Both dredging methods create temporary impacts to water turbidity and dissolved oxygen, biomass, habitat quality and native species. Dredging would only be implemented in marina and channel areas previously permitted for dredging, and dredging would be limited to the depth previously dredged, also known in the Lake Tahoe Basin as maintenance dredging.

The UC Davis Tahoe Research Group (TERC) prepared final reporting for *Impacts of Marina Dredging on Lake Tahoe Water Quality* in 1996, which is the most comprehensive study of environmental impacts to the Lake Tahoe water body from dredging actions and is commonly referred to as the Tahoe Dredge Study. This final reporting analyzed historical dredging data for the period of record from 1988 to 1992 to assess potential water quality impacts from marina and harbor dredging and presented recommendations for physical and mechanical measures, operational control measures and monitoring measures, as based on the summary of findings. Details of this study, and summary of findings of the Tahoe Dredge Study (TERC 1996) pertaining to potential impacts to water quality are presented in Appendix A.

Dredging actions result in a temporary release of marina, lagoon or channel bed substrates into the water column, resulting in localized elevated turbidity and select nutrient concentrations and the potential release of toxic chemicals and heavy metals, if such contaminants are present in substrates, and mitigation for which is described below. Dredge sediments contain significant amounts of water, with magnitude dependent on substrate porosity and dredging method. During dewatering, nutrients can return to the lake via surface runoff and percolation of spoil waters into subsurface water. The predominant particle sizes present and the degree of consolidation are important factors in determining appropriate dredging methods. Certain sediment types such as clays and organics have the potential to bind significant amounts of certain nutrients and other contaminants. Clays, once resuspended, may remain in the water column for long periods of time, and nutrients attached to the clay particles may be subject to physicochemical changes and/or biological utilization. The ability of sediments to bind nutrients include sorption properties (i.e., adsorption and chemosorption), pH, redox potential, clay and humic content, and presence of hydrous oxides and sulfides.

The action of dredging would not introduce new sources of nutrients and contaminants found in bed substrates, but in treatment areas with bed substrates suspected to contain contaminants that may persist from prior use and inputs, pre-dredging analysis of heavy metals, total petroleum hydrocarbons, as conditioned by Section 401 WQC authorization, would identify the potential to temporarily resuspend such contaminants into the water column during dredging actions. Refer to Appendix A for a summary of findings of the Tahoe Dredge Study. Contaminants mobilized into the water column would be contained within the turbidity curtain until bed substrates and attached contaminants settle and turbidity within containment area returns to lake background levels. When levels of toxic substances are measured to be high, dredge spoil disposal is directed to occur outside of the Lake Tahoe Basin. Indirect effects of dredging can include short-term, localized increase in algal growth and phytoplankton productivity resulting from nutrient release into the water column. The settling of entrained bed substrates from the water column and return to background turbidity prior to turbidity curtain removal is required, which serves to isolate and minimum potential effects of temporary nutrient release. Phytoplankton have been found to typically be co-limited by nitrogen and phosphorus concentrations. Specifically, additions of dissolved inorganic nitrogen and biologically available phosphorus (representative of approximately one to six percent of total phosphorus resuspended in the water column) into the water column) were found to potentially lead to short-term, localized areas of increased phytoplankton growth within the Lake Tahoe dredging study areas and more studies were recommended to be conducted However, turbidity was found to be statistically associated with the level of total phosphorus resuspended during dredging. In areas of AIP infestations suspected to contain toxic levels of contaminants in bed substrates or considered high risk for HABs, suction dredging may be the preferred control method since suction dredging has low to moderate resuspension of bed substrates as compared to mechanical dredging. Long-term impacts of dredging, as measured by contributions of TN and TP, are low relative to contributions from stream inputs, atmospheric inputs and internal loading of nutrients from the lake hypolimnion (UC Davis 1996).

The management strategy for the Lake Tahoe Hydrologic Unit is to minimize incremental sources of nutrients and thereby minimize the potential cumulative input of nutrients to the lake. The additive contributions of individual dredging actions for AIP control conducted over several years would constitute non-natural inputs, which when combined with other man-derived sources of nutrients (e.g. land disturbance, runoff from impervious surfaces on individual parcels, fertilizer usage, etc.) may have a cumulative, additive effect on the levels of nutrients available in the lake to support algal growth. Strict measures to minimize short-term, localized degradation to water quality, selection of appropriate dredge method as dictated by bed substrate composition, and the seasonal timing of and length of dredging actions in consideration of stream water inflows and lake weather patterns would reduce the potential for long-term degradation and risk of combined cumulative adverse effects to water quality. Deployment of turbidity/silt curtains, as illustrated in Figure 3.11-1, for containment of project-level, localized effects is required by programmatic authorizations and is a component of **MITIGATION MEASURE HYDRO-1**. Cumulative effects of this AIP control action would beneficially impact habitat quality through reduction of AIP biomass and the coupled release of nutrients to the water body during seasonal die-off, which when unaddressed can cause algal growth and related water quality degradation. Removal of accumulated fine sediments and organic materials (i.e., muck) and exposure of native bed substrates may allow for recolonization of native plant populations, but the success of recolonization of native plants would likely be influenced by the proximity to other AIP infestations and site-specific hydrologic conditions.

Figure 3.11-1. Photographs of Turbidity Curtains

TKPOA Turbidity curtains (2015)

AIP control by site-specific suction or mechanical dredging would be authorized under NWP 27 (Aquatic Habitat Restoration, Enhancement and Establishment Activities), the associated CWA Sections 404/401 regional and project-specific conditions and the CDFW LSA/SAA agreement for routine maintenance. Additionally, in Nevada, the conditions of the Working in Waterways approval would also apply, and when dictated by the elevation of a specific dredge area, conditions of CDSL lease agreements or NVDSL management license would also apply. Suction dredging actions requiring discharge of spoil waters to detention basins would require additional Lahontan review and authorization. While discharge to a sanitary sewer does not require regulatory coverage under the NPDES Program, capacity of sanitary sewer systems must be confirmed with the service provider and a will serve letter issued.

Tahoe Dredge Study results and findings were considered during development of general NPDES permits for industrial stormwater discharges from marinas in the Lake Tahoe Hydrologic Unit. Board Order No. R6T-2016-0038 (NPDES No. CAG616003) is the most current permit and commonly referred to as the Marina General Permit, which specifies that discharges from maintenance dredging require individual Basin Plan exemption criteria and monitoring requirements for CWA Section 401 water quality certification. The addition of dredging for control of AIP as part of the Project would necessitate amendment to or replacement of Board Order R6T-2016-0018 to include Basin Plan exemption criteria, project conditions, and monitoring and reporting requirements specific to removal and control of AIP by suction and mechanical dredging methods.

Through compliance with CWA Section 404/401 regional and project-specific conditions, CDFW LSA/SAA agreement for routine maintenance (or in Nevada, Working in Waterways permit conditions) and TRPA permit conditions, AIP control by dredging would result in less than significant impacts to water quality and beneficial uses. To avoid and reduce potential impacts from AIP control through suction and mechanical dredging to a level of less than significant, **MITIGATION MEASURE HYDRO-1** incorporates project conditions and monitoring and reporting requirements associated with maintenance dredging permits most recently issued in 2015.

Implementation of **MITIGATION MEASURE HAZMAT-1**, which requires spill prevention and response, would reduce the risk of new pollutants and contaminants entering the surface waters when motorized vessels and equipment are used for AIP control through dredging.

Atmospheric Deposition

See the discussions and analysis for Question 3.4-2, which recommends implementation of **MITIGATION MEASURES AQ-1** and **AQ-2** detailing idling restrictions and dust control measures, respectively.

Anti-Degradation Policy

The State anti-degradation policy (Resolution No. 68-16) is incorporated into regional water quality control plans, including the Lahontan Basin Plan. The policy applies to high-quality waters only (i.e., Lake Tahoe and tributaries) and requires that existing high quality be maintained to the maximum extent possible. The Project would implement reasonable and appropriate measures for the protection of surface water quality and beneficial uses and complies with conditions set forth in Board Order R6T-2016-0018, which will be amended or superseded. Based on the stated evaluation criteria for determination of significant impacts to surface water quality and beneficial uses, the Project would maintain beneficial uses and protects surface water quality through the Project proposal and implementation of compliance measures for conformance with federal, regional, State, and City codified regulations.

The Project as proposed would not purposefully discharge any waste that would degrade water quality, and the potential for impacting water quality during AIP control implementation would be avoided or reduced to a level of less than significant through implementation of **MITIGATION MEASURE HYDRO-1**, which specifies compliance with the criteria, general conditions, and project conditions specific to each regulatory authority and programmatic authorization for AIP control actions, and **MITIGATION MEASURE HAZMAT-1**, which requires spill prevention and response.

3.11-2. Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? (CEQA Xb)

<u>No Impact</u>. Implementation of AIP control actions take place in surface water bodies and do not involve the use of groundwater supplies, nor do such actions interfere with groundwater recharge. As a result the Project would result in no impact to groundwater supplies or recharge and would not impede sustainable groundwater management within the Lake Tahoe Basin and the Lower Truckee River hydrologic unit.

3.11-3. Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: (CEQA Xc)

3.11-3.i) Result in substantial on-or offsite erosion or siltation?

<u>No Impact.</u> Surveillance, hand removal, diver-assisted hand suction removal and UV-C Light control actions create no permanent change to drainage patterns of the Project area and do not create impervious surfaces. These AIP control actions would result in no impact to on- or off-site erosion and siltation.

LFAs function to circulate open waters of marina and/or control ingress and egress of suspended organic materials, including AIP, into and out of marinas. These systems do not alter existing drainage patterns on adjacent lands nor create new impervious surfaces. This AIP control action would result in no change to existing drainage patterns on adjacent lands, and by location would not create on- or off-site erosion or siltation.

Benthic barriers are installed and secured along a lake or stream bed for a specific time period and are pervious. Monitoring of AIP control projects that have been implemented to date do not report changes in drainage patterns in these project areas. This AIP control action would result in no change to existing drainage patterns on adjacent lands, and by location would not create on- or off-site erosion or siltation.

Suction and mechanical dredging conducted for AIP control would be limited to the Lake Tahoe water body. These AIP control actions would create no change to existing drainage patterns of adjacent lands, and by location would not result in on- or off-site erosion or siltation.

3.11-3.ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

No Impact. AIP control actions are conducted within surface water bodies, are discrete and temporary in nature, and would result in no increase in the rate or amount of surface runoff. The Project would create no change to surface runoff, and therefore, would have no impact to flood risk on- or offsite.

3.11-3.iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less than Significant Impact. AIP control actions such as surveillance monitoring, hand removal, LFAs, benthic barriers, and UV-C Light control do not create or contribute to surface runoff or provide additional sources of polluted runoff. Diver-assisted hand suction removal, suction dredging and mechanical dredging actions, however, do create spoil waters, and if dewatering is necessitated by dredging, runoff is created.

Diver-assisted hand suction removal is conducted within the surface water body. AIP are pulled out at the roots by hand and plant matter is fed into a small hand held suction hose that is mounted on a floating work platform or barge or small boat. The suction hose transports plant matter and associated water to a conveyor system and collection box. The plant matter is separated through a screen and placed in containers for offshore disposal. The water is returned to the lake (or stream) through the water column. This action may cause minor temporary disturbance to bed substrates, but would not result in prolonged disturbance that would result in substantial additional sources of polluted runoff.

Turbid runoff created during mechanical dredging actions returns to the containment area, a requirement of CWA Section 404/401 authorizations. Containment is most often accomplished through the use, ongoing monitoring, and maintenance of turbidity/silt curtains. Dredging actions must cease during periods of extreme wave action that may compromise the containment function of the turbidity curtains. Suction dredging actions requiring discharge of spoil waters to detention basins would require additional Lahontan review and authorization. While discharge to a sanitary sewer does not require regulatory coverage under the NPDES Program, capacity of sanitary sewer systems must be confirmed with the service provider and a will serve letter issued.

3.11-3.iv) Impede or redirect flood flows?

No Impact. AIP control actions are conducted within surface water bodies and are discrete and temporary in nature. With the exception of LFA systems, the Project would not install structures or facilities that could impede or redirect flood flows, and therefore, would have no impact. LFA systems are installed within the water column and would have no impact to flood flows.

3.11-4. In flood hazard, tsunami, or seiche zones, would the Project risk release of pollutants due to project inundation? (CEQA Xd)

No Impact. Lake Tahoe is a large surface water body with the potential for the production of seiche waves. The Project area as dictated by location is inundated. Project actions would not increase the risk of seiche waves or increase public exposure to this risk. The Lake Tahoe Basin is classified as having low incidence and susceptibility of small or large landslides (USGS 2007), and Project actions would not expose the public or property to an increased risk or susceptibility from these events.

3.11-5. Would the Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? (CEQA Xe)

Less than Significant Impact with Mitigation Measures. California Code of Regulations (CCR) title 23, section 3831(e) grants the Lahontan Executive Officer the authority to grant or deny Water Quality Certification (WQC) for projects in accordance with CWA section 401. If a project conflicts with the Basin Plan, Lahontan has delegated authority to grant exemptions for Basin Plan waste discharge prohibitions to the Executive Officer for specific discharges where the Project meets the conditions in the Basin Plan.

Section 401 of the CWA (33 U.S.C., paragraph 1341) requires that any applicant for a CWA Section 404 permit, who plans to conduct any activity that may result in discharge of dredged or fill materials to waters of the United States, must provide to the permitting agency a certification that the discharge will be in compliance with applicable water quality standards of the state in which the discharge will originate. No section 404 permit may be granted (or valid) until such certification is obtained. The Lead Agency has received USACE authorization to utilize benthic barriers, and conduct suction and mechanical dredging under NWP 27 (Aquatic Habitat, Restoration, Enhancement, and Establishment Activities). LFAs are authorized under NWP 5, Scientific Measurement Devices. Surveillance monitoring, hand removal, diver-assisted suction removal and UVC Light control require no CWA Section 404/401 authorization. Diver-assisted suction removal and UV-C Light control actions would be authorized under CWA Section 10, as such actions would benefit navigation but would not result in dredge or fill within waters of the U.S.

The Project meets the conditions and criteria for Section 401 WQC and Basin Plan Prohibition Exemption through the following findings, subject to concurrence by the Water Board. If they do not agree that exemptions could be made, no work could be conducted under the prohibitions listed below:

Basin Plan Discharge Prohibitions, Prohibition Exemption Criteria, and Findings

Chapter 4.1 of the Basin Plan specifies prohibition no. 2 below that is applicable to lands within the 100-year floodplain of the Truckee River:

1. **Prohibition 4.1(2):** *The discharge, or threatened discharge, attributable to human activities, of waste to lands within the 100-year floodplain of Truckee River, Little Truckee River, and their tributaries is prohibited.*

The Lahontan Water Board may grant an exemption to Prohibition 4.1(2), for projects intended to reduce or mitigate existing sources of erosion or water pollution, or to restore or improve the floodplain function, when the Lahontan Water Board finds all of the following criteria are satisfied:

> *a. There is no reasonable alternative that avoids or reduces the extent of encroachment by the project within the 100-year floodplain.*
>
> The purpose of the Project is to remove AIP species that have established within the 100-year floodplain of the Truckee River, which will minimize the potential for AIP to spread throughout the Truckee River and its floodplain. The Project is intended to reduce water pollution by removing aquatic invasive weeds.

> There are no reasonable alternatives that would reduce the extent of encroachment within the 100-year floodplain of the Truckee River because the Project, by its very nature, must be located in these wet environments since these are the targeted clean up areas that have become infested. The floodplain populations of AIP present in these locations are susceptible to spread if left in place.

Chapter 5.2 of the Basin Plan specifies prohibitions nos. 2 and 3 below that are applicable to surface waters, 100-year floodplains, and Stream Environment Zones (SEZs) in the Lake Tahoe basin:

2. **Prohibitions 5.2(2) and 5.2(3):** *5.2 (2) The discharge attributable to human activities of any waste or deleterious material to land below the highwater rim of Lake Tahoe or within the 100-year floodplain of any tributary to Lake Tahoe is prohibited. 5.2 (3) The discharge attributable to human activities of any waste or deleterious material to SEZs in the Lake Tahoe HU is prohibited.*

The Lahontan Water Board may grant an exemption to the Prohibitions 5.2 (2) and 5.2 (3), for erosion control projects, wetland rehabilitation projects, SEZ restoration projects, and similar projects, programs, and facilities, when the Lahontan Water Board finds all of the following criteria are satisfied:

> *a. There is no reasonable alternative, including relocation, that avoids or reduces the extent of encroachment below the highwater rim of Lake Tahoe, with the 100-year floodplain, or within the SEZ; and*
> *b. Impacts are fully mitigated.*
>
> The purpose of the Project is to remove AIP established in Lake Tahoe's waters, which will minimize the potential for AIP to spread throughout the Lake. The Project is considered a habitat restoration project eligible for a prohibition exemption. There are no reasonable alternatives that would reduce the extent of encroachment within the 100-year floodplain, or below the highwater rim of Lake Tahoe because the Project, by its very nature, must be located in these wet environments since these are the infested areas targeted for clean-up. The shorezone and floodplain populations of AIP plants present in these locations are susceptible to spread if left in place.

The Lead Agency/Applicant is implementing the Project to eliminate or minimize the area of existing AIP infestations and to minimize the potential for the AIP to spread throughout Lake Tahoe, tributaries and marshlands. Impacts associated with the Project have been evaluated and the Project would have no significant effect on the environment with the mitigation measures included as a condition of the approval of the Project. Specifically, implementation of **MITIGATION MEASURES HYDRO-1** and **HAZMAT-2** would reduce potential impacts to water quality and beneficial uses to a level of less than significant.

The 2012 TRPA Regional Plan is a regulatory framework that includes a number of initiatives and documents, including the Environmental Improvement Program (EIP) and the Lake Tahoe Water Quality Management Plan , which is required for certain geographical areas by the federal CWA. The Lake Tahoe Water Quality Management Plan sets forth the components of the water quality management system in the Lake Tahoe Region, was certified by the California State Water Board, Lahontan, NDEP, and USEPA in 2013, and is organized to reflect the water quality management plan elements required by the USEPA regulations at 40 C.F.R. Section 130.6, which implements Sections 208 and 303(e) of the Clean Water Act, as well as the unique environmental situation in the Lake Tahoe Region.

A priority of the 2012 TRPA Regional Plan is to accelerate water quality restoration and other ecological benefits. The Project, through control of AIP, implements the Watershed, Habitat, and Water Quality program area. In 1987, TRPA adopted nine environmental threshold carrying capacities (thresholds), which set environmental standards for the Lake Tahoe basin and indirectly define the capacity of the Region to accommodate additional land development. The 2015 Threshold Evaluation Report offers a snapshot of the health of the ecosystem in the Tahoe Basin by documenting the status and trends of 178 threshold standards in nine categories: Air quality, water quality, soil conservation, vegetation, fisheries, wildlife, scenic resources, noise, and recreation. This evaluation of the environmental threshold carrying capacities is the sixth report published since the adoption of the Regional Plan in 1987 and was reviewed by an independent panel of scientific experts who found the report to be technically sound. The Project would contribute towards attainment of the Water Quality Threshold: *Return the lake to 1960s water clarity and algal levels by reducing nutrient and sediment in surface runoff and groundwater.*

The California legislature passed the Sustainable Groundwater Management Act in 2014 creating a statewide framework for groundwater regulation in California. The Nevada Division of Water Planning developed the Nevada State Water Plan, with allocation of groundwater resources managed by the state engineer in the Nevada Division of Water Resources (NDWR) in conformance with the Nevada Revised Statutes (NRS) Chapter 534. The NDEP, in cooperation with other agencies, has developed and is now implementing a Comprehensive State Ground Water Protection Program (CSGWPP) to complement the existing water quality regulations. The Project would result in no impact to groundwater, and therefore, would conflict with no existing or planned sustainable groundwater management plan.

3.11-6. Will the Project result in changes in currents, or the course or direction of water movements? (TRPA 3a)

<u>No.</u> Chapter 63 of the TRPA Code of Ordinances requires the protection of fish resources and limits modifications of streams. Refer to the analysis for Question 3.11-3, which concludes the Project would not substantially alter the existing drainage pattern or stream or river courses of the Project area. AIP control actions, with the exception of LFA systems, would not result in changes to currents or the course or direction of water movement. LFA systems by design may have nominal effects to currents transporting floating materials into and out of closed marina systems, with some systems designed to stimulate water movement and purposefully create water circulation within marinas. Such systems would have no effect to currents or the course or direction of water movements in Lake Tahoe. Benthic barriers installed along stream beds may have a minor effect to stream velocity but do not change the direction of water movement (Tahoe RCD 2018).

3.11-7. Will the Project result in changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20 yr. 1 hr. storm runoff (approximately 1 inch per hour) cannot be contained on the site? (TRPA 3b)

<u>No.</u> See the analysis for Question 3.11-3, which concludes that the Project would result in no impact to drainage patterns and would not create surface water runoff off-site.

3.11-8. Will the Project result in alterations to the course or flow of 100-year floodwaters? (TRPA 3c)

<u>No.</u> See the analysis for Questions 3.11-3ii and 3.11-3iv, which conclude that the Project would result in no impact to flood risk or flood flows.

3.11-9. Will the Project result in a change in the amount of surface water in any water body? (TRPA 3d)

<u>No</u>. Surveillance monitoring, hand removal, LFA systems, diver-assisted hand suction removal, benthic barriers, and UV-C Light control actions create no change in the amount of surface water in any water bodies of the Project area, and therefore, would result in no impact.

Mechanical dredging actions would remove lake bed substrates during AIP removal and dewater back to the water column within a containment area. Suction dredging for AIP removal would either return treated discharge back to the water column within a containment area or depending on volume would discharge to sanitary sewer or stormwater facility. Dredging for AIP removal would be surficial in nature, dredging substrates to below the root zone of AIP, and as restricted by TRPA Regional Plan ordinances, such actions may not increase the lake bed depth beyond previously permitted elevations. The Project would not result in a permanent change in the amount of surface water in any water body through additions or extractions.

3.11-10. Will the Project result in discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity? (TRPA 3e)

No, with Mitigation. As stated in the 2015 Threshold Evaluation (TRPA 2016), the health of aquatic systems is assessed with respect to six threshold standards categories: 1) Lake Tahoe pelagic (deep) waters, 2) Lake Tahoe littoral (nearshore) waters, 3) tributaries, 4) surface runoffs, 5) groundwater, and 6) other lakes (i.e., lakes other than Lake Tahoe). Fine sediment particles (< 16µm) and nutrients that support algal growth (nitrogen and phosphorus) are the primary pollutants of concern in the Region because of the negative impact on transparency (Lahontan & NDEP, 2010a) and, in the case of nutrients, the blueness of the lake (Watanabe et al., 2016). Additionally, many components of the aquatic system are thought to be adversely affected by these pollutants (Reuter et al., 2009). Specific to the nearshore and sediment loading, there is a 1 NTU turbidity threshold applied by TRPA in shallow waters of Lake Tahoe not directly influences by stream discharges. AIP control through diver assisted hand suction removal, benthic barrier installation and removal, and dredging create temporary disturbances to bed substrates but would not introduce new sources of sediment and increase sediment loading.

See the analysis for Question 3.11-1, which concludes potential temporary impacts to surface water quality would be avoided or reduced to a level of less than significant through implementation of **MITIGATION MEASURES HYDRO-1 and HAZMAT-1.**

3.11-11. Will the Project result in alteration of the direction or rate of flow of ground water? (TRPA 3f)

No. Implementation of AIP control actions take place in surface water bodies and do not involve ground water aquifers. The Project would result in no impact to the direction or rate of flow of ground water.

3.11-12. Will the Project result in change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations? (TRPA 3g)

No. Implementation of AIP control actions take place in surface water bodies and do not involve ground water aquifers. Surveillance monitoring, hand removal, LFAs, diver-assisted hand suction removal, benthic barriers, and UV-C Light control actions result in no direct additions, withdrawals or interception of ground water aquifers, and therefore, would result in no impact to the quantity of ground water.

Suction and mechanical dredging actions would remove some lake bed substrates during AIP removal, but would not increase the lake bed depth beyond previously permitted elevations and would not create a significant change in the quantity of ground water through interception by cuts or excavations. Dewatering results in some percolation of spoil waters, but would not constitute a new permanent source of direct addition to a groundwater aquifer.

3.11-13. Will the Project result in substantial reduction in the amount of water otherwise available for public water supplies? (TRPA 3h)

No. If the Project creates a demand that exceeds available water supplies, a significant impact to source water occurs, as defined in TRPA Code Chapter 60. Surveillance monitoring, hand removal, LFAs, diver-assisted hand suction removal, benthic barriers, and UV-C Light control actions do not consume or otherwise reduce the amount of surface or ground waters and would result in no impact to public water supplies.

Diver-assisted hand suction removal, suction dredging and mechanical dredging actions utilize surface waters within the available water column. For diver-assisted hand suction removal, once plant substrates are separated through a screen or equivalent tool, water is returned to the water body through the water column. For mechanical dredging, dewatering occurs in a designated area of the lake shore or on a barge surface within a containment area and then settled to the lake bed through the water column. Depending on substrate characteristics, dewatering for suction dredging occurs within a containment area, as described for mechanical dredging, or via impoundment basins or settling tank systems. Although not preferable, treated spoil waters may necessitate discharge to sanitary sewer. No AIP control method would result in a permanent substantial reduction in the amount of water otherwise available for public water supplies.

3.11-14. Will the Project result in exposure of people or property to water related hazards such as flooding and/or wave action from 100-year storm occurrence or seiches? (TRPA 3i)

<u>No.</u> An increase in risk of inundation by seiche, tsunami, or mudflow as a result of Project actions constitutes a significant impact. See the analysis for Question 3.11-4, which concludes no impact.

3.11-15. Will the Project result in potential discharge of contaminants to the groundwater or any alteration of groundwater quality? (TRPA 3j)

<u>No, with Mitigation.</u> Implementation of AIP control actions take place in surface water bodies and do not involve ground water aquifers. Within the lake, tributary and Lower Truckee River portions of the project area, potential discharge of contaminants would occur within surface waters. Within marsh portions of the project area, potential discharge of contaminants would be to the soil profile. The Project would not utilize pesticides, chemicals, or radiation. Machinery and watercraft would require the use of oils, lubricants, and fuels; however the quantities of these substrates would be no greater than used for general construction equipment or watercraft and the risk of explosion is low. Spills, upsets, or other construction related accidents could result in an inadvertent release of fuel or other hazardous substances into the environment.

The Project would avoid and minimize the potential discharge of contaminants through implementation of **MITIGATION MEASURES HYDRO-1** and **HAZMAT-1** to reduce potential impacts to surface water quality, soils and resultant potential indirect impacts to groundwater to a level of less than significant.

3.11-16. Is the Project located within 600 feet of a drinking water source? (TRPA 3k)

<u>No, with Mitigation.</u> A contaminating land use within 600 feet of a drinking water source identified on TRPA Source Water Assessment Maps constitutes a significant impact as defined by TRPA Code Section 60.3. TRPA Code Sub-section 60.3.3A defines Source Water as "water drawn to supply drinking water from an aquifer or from a surface water body by an intake, regardless of whether such water is treated before distribution". Implementation of AIP control actions take place in surface water bodies and do not involve ground water aquifers; however, actions may occur within 600 feet of an existing drinking water intake. The Project would avoid temporary potential effects to intakes through implementation of **MITIGATION MEASURE HYDRO-1**, which requires **<u>the project proponent and/or Tahoe RCD to notify water purveyors of control work within 0.25 mile of</u>** water intakes **<u>and implement listed protections if required</u>** ~~within 25 feet of control areas to be turned off during removal of benthic barriers~~. Because the Project would not create a permanent contaminating land use and the control of AIP is conducted to improve degraded nearshore aquatic habitat and associated water quality in areas of existing lake intakes, the Project would benefit source waters.

3.11.4 NEPA Analysis of Effects

USACE involvement in the Lake Tahoe Basin is shaped by two programs: the Tahoe Partnership and the Tahoe Section 108 programs. The Tahoe Partnership program provides watershed planning and restoration as part of a multi-agency environmental improvement program to increase global climate change adaptation policy and improve storm water models and tools.

Under CWA Section 404(e), the USACE can issue general permits to authorize activities that have only minimal individual and cumulative adverse environmental effects. The USACE will review the Project for authorization under NWP 27. USACE division engineers may add, after public review and consultation, regional conditions to nationwide permits in order to protect local aquatic ecosystems or to minimize adverse effects on fish or shellfish spawning, wildlife nesting or other ecologically critical areas.

The 2016 Forest Plan provides guidance for using BMPs to control nonpoint source pollution related to all management actions with the potential to affect water quality on NFS lands, and to avoid minimize, or mitigate adverse effects to soil, water quality, and riparian resources.

Hydrology Other Sources of Information:

- R5 FSH 2509.22- Soil and Water Conservation Handbook, Chapter 10, Water Quality Management Handbook
- FS-990a -National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide
- FSH 2509.22 – Region 5 Soil and Water Conservation Handbook, Chapter 20, Cumulative Watershed Effects

Hydrology and water quality impacts are evaluated in terms of NEPA Intensity Factors 1, 3, 7 and 10.

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. **MITIGATION MEASURE HYDRO-1** implements Forest Plan standards SG4 (Design all Forest management activities to prevent violations of applicable water quality standards), SG5 (Apply current version of the PSW Region Best Management Practices as described in Forest Service Handbook direction for Soil and Water Conservation, Water Quality Management, and Forest Service National Core BMP Technical Guide to all management activities), and SG7 (Store fuel and other toxic substrates only at designated sites. Prohibit storage of fuel and other toxic substrates within SEZs except at designated administrative sites and sites covered by a Special Use Authorization. Refuel outside of SEZs unless there are no other alternatives).

Issue - Point and Nonpoint Source Pollution

Direct and Indirect Effects

In 2003, the Forest Service identified invasive species as one of four critical threats to the nation’s ecosystems, with invasive plants posing a significant threat to ecological function due to ability to displace native species and reduce plant diversity, alter nutrient cycles, affect water quality, decrease the availability of forage for wildlife and degrade soil structure (LTBMU 2016). Sediment bound nutrients move into the water column through plant root uptake and subsequent plant senescence (die-off) and as a result AIP are suspected of contributing to increased phytoplankton and reductions in water clarity. Reduction of water temperatures and nutrients, increase in dissolved oxygen, and improvement of bed substrate conditions are associated with the control of AIP infestations, cumulatively reducing conditions that favor re-infestation by AIP.

The USACE Sacramento and Reno Districts work with local partners to combat AIP because they pose a major threat to ecosystem health in the Lake Tahoe Basin by degrading water quality and destroying important habitat to native species, noting that AIP can wrap around propellers and clog up filters on watercraft and populate the water column at densities that inhibit navigation.

AIP control would directly improve light availability throughout the water column through the removal of AIP biomass available for decomposing in the water column of the lake water body, tributaries and inundated marshlands, while indirectly providing beneficial effects to public health and safety. Appendix A, Table A-3 provides a summary of potential impacts as support by AIP background documents, reports and studies and published scientific research papers in support of potential effects conclusions. Referencing the analyses for CEQA 3.11-1 and TRPA 3.11-10 above, potential direct and indirect effects of individual AIP control methods are as follows:

Surveillance monitoring creates no direct or indirect short-term or long-term adverse effects to water quality, and such this AIP control action would not result in a violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Surveillance would result in no impacts to water quality and beneficial uses. Continuation of current surveillance monitoring and implementation of new visual monitoring programs would require no specific regulatory authorizations or mitigations.

Hand removal involves manual removal of plant bodies from bed substrates and skimming of plant fragments from a water surface or water column. Minor bed disturbance may occur depending on control site conditions, but such disturbance would have only minor short-term adverse effect to water clarity in a discrete location. Monitoring of completed and on-going Hand removal projects reports no long-term adverse change to turbidity or water clarity. As Hand removal creates no direct or indirect long-term adverse effects to water quality, such control actions would not result in a violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Hand removal actions would result in temporary and less than significant impacts to water quality and beneficial uses. Continuation of on-going hand removal projects and implementation of future hand removal actions would require no specific regulatory authorizations or mitigations.

LFA designs are variable, as dictated by site conditions, but serve to initiate laminar flow inversion and oxygenation to improve water and sediment quality and reduce AIP growth. Installation of these systems temporarily disturb bed substrates and result in minor, less than significant discharge. Disturbance is minimized by hand placing diffusers and air lines on the marina lake bottom using divers in lieu of heavy equipment. Elevated turbidity is short-term during the installation period, with operation of diffusers generating no long-term elevated turbidity or increases in suspended sediment. Should operations produce discharge, systems can be deactivated to address potential adverse water quality impacts. Through compliance with CWA Section 404/401 regional and project-specific conditions the CDFW LSA/SAA agreement for routine maintenance and TRPA permit conditions, LFA systems would result in less than significant impacts to water quality and beneficial uses. Through implementation of **MITIGATION MEASURE HYDRO-1**, potential impacts to water quality and beneficial uses from continuation of current projects and implementation of future LFAs would be reduce to a level of less than significant.

Diver-assisted suction removal to control AIP is accomplished with trained divers selectively removing the plant body, including the root system, by hand and transferring materials for disposal via suction hose and by hand to a catchment basket or similar. Implementation can create minor disturbance to bed substrates and result in short-term, localized effect to water clarity as a result of elevated turbidity from the entrainment of organic materials and bed substrates, mitigation for which is described below. Monitoring results from previously completed and on-going AIS control projects in the Lake Tahoe Region report that elevated turbidity levels are temporary and localized in nature (CDPR 2012; Tahoe RCD 2017; Tahoe RCD 2018) and indicate no long-term adverse effect to water quality of the lake water body or stream course. Through compliance with CWA Section 404/401 regional and project-specific conditions, CDFW LSA/SAA agreement for routine maintenance (or in Nevada, Working in Waterways permit conditions) and TRPA permit conditions, diver-assisted suction removal actions would result in less than significant impacts to water quality and beneficial uses. Through implementation of **MITIGATION MEASURE HYDRO-1**, potential impacts to water quality and beneficial uses from diver-assisted suction removal would be reduce to a level of less than significant. Implementation of **MITIGATION MEASURE HAZMAT-1**, which requires spill prevention and response, would reduce the risk of new pollutants and contaminants entering the surface waters when diver-assisted suction removal utilizes motorized vessels.

Benthic barriers treatment consists of placing sections of gas permeable, black landscape cloth, plastic, jute, or other material, over the top of submerged vegetation to exclude light. This control method is typically deployed in high priority areas of dense plant growth. Following barrier placement, diver-assisted hand suction removal is conducted to achieve 99%-100% plant removal at the perimeter of the barriers. Installation and removal of benthic barriers can temporarily affect water clarity as a result of elevated turbidity from entrainment of organic materials and bed substrates. Barriers can have fine sediment deposited on them during the period of deployment, and this fine sediment, along with decaying plant material, can cause turbidity as the barriers are removed, mitigation for which is described below. Benthic barrier water quality monitoring results for Emerald Bay control projects indicate that turbidity is localized and temporary in nature (CDPR 2012). The duration of employment of benthic barriers is an important factor, as sediment accumulation on barrier surfaces can occur, which can allow for reestablishment of AIP and necessitate follow up or secondary treatment (TKPOA 2018). Over the discrete time period that barriers function to promote AIP die-off, concentrations of dissolved oxygen, biomass, and habitat quality may also be impacted. Indirect effects to water quality occur during die off and decomposition, but would mimic effects to water quality during plant seasonal die-off and decomposition and would not initially differ significantly from baseline conditions. Additively, as plant density and the extent of AIP infestations decrease, decomposition of biomass would also decrease. Motorized watercrafts, when used for barrier installation, have the potential to contribute pollutants such as gasoline and oil to the water column through spills, leaks or other releases and to violate water quality standards and waste discharge requirements. Through compliance with CWA Section 404/401 regional and project-specific conditions, CDFW LSA/SAA agreement for routine maintenance (or in Nevada, Working in Waterways permit conditions), and TPRA permit conditions, AIP control by benthic barriers would result in less than significant impacts to water quality and beneficial uses. Through implementation of **MITIGATION MEASURE HYDRO-1**, potential impacts to water quality and beneficial uses from AIP control by benthic barriers would be reduce to a level of less than significant. Implementation of **MITIGATION MEASURE HAZMAT-1**, which requires spill prevention and response, would reduce the risk of new pollutants and contaminants entering the surface waters when motorized vessels are used for installation of benthic barriers.

The UV-C Light control method controls AIP through the application of ultraviolet-C light, a short wave electromagnetic radiation light that damages the DNA and cellular structure of aquatic plants and their fragments, disrupting the life cycle of the plant. As with benthic barriers, UV-C Light promotes AIP die-off, and over this discrete time period, concentrations of dissolved nutrients, biomass, and habitat and native species may be impacted. Indirect effects to water quality occur during die off and decomposition, but would mimic effects to water quality during plant seasonal die-off and decomposition and would not initially differ significantly from baseline conditions, while overtime plant density and the extent of AIP infestations (i.e., new biomass sources) would decrease. During field pilot testing, water quality parameters were measured to gauge compliance with the Basin Plan and TRPA Regional Plan water quality objectives. Water quality monitoring results reported no instances of violation of narrative or numeric WQOs. Specifically, UV-C Light control created no measurable change during implementation to water temperature, dissolved oxygen concentrations, pH, specific conductivity, total dissolved solids or turbidity, as compared to pre-project baseline concentrations. Because UV-C Light control is applied at the crown of the plant and does not necessitate disturbance of bed substrates, elevated turbidity does not result during implementation. The UV-C Light control method does not place fill or create discharge and would be authorized under CWA Section 10 (i.e., change to navigation). Through compliance with CWA Section 10 regional and project-specific conditions and TPRA permit conditions, UV-C Light control actions would result in less than significant impacts to water quality and beneficial uses. Through implementation of **MITIGATION MEASURE HYDRO-1**, potential impacts to water quality and beneficial uses from UV-C Light control would be reduce to a level of less than significant. Motorized watercrafts, when used for UV-C Light control, have the potential to contribute pollutants such as gasoline and oil to the water column through spills, leaks, or other releases and to violate water quality standards and waste discharge requirements. Implementation of **MITIGATION MEASURE HAZMAT-1**, which requires spill prevention and response, would reduce the risk of new pollutants and contaminants entering the surface waters when motorized vessels are used for UV-C Light control.

AIP control through site dredging removes the entire plant, including the root system and the associated depth of the bed substrate. Dredging would only be implemented in marina areas previously permitted for dredging, and dredging would be limited to the depth previously dredged, also known in the Lake Tahoe Basin as maintenance dredging. Both suction and mechanical dredging methods create temporary impacts to localized water quality and dissolved oxygen, biomass, habitat quality and native species. Dredging actions result in a temporary release of marina, lagoon or channel bed substrates into the water column, resulting in localized elevated turbidity and select nutrient concentrations and the potential release of toxic chemicals and heavy metals, if such contaminants are present in substrates. Indirect effects of dredging can include short-term, localized increase in algal growth and phytoplankton productivity resulting from nutrient release. Long-term impacts of dredging, as measured by contributions of TN and TP, are low relative to contributions from stream inputs, atmospheric inputs and internal loading of nutrients from the lake hypolimnion (UC Davis 1996). Strict measures to minimize short-term, localized degradation to water quality, selection of appropriate dredge method as dictated by bed substrate composition, and the seasonal timing of and length of dredging actions in consideration of stream water inflows and lake weather patterns would reduce the potential for long-term degradation and risk of combined cumulative adverse effects to water quality. Deployment of turbidity/silt curtains for containment of project-level, localized effects is required by programmatic authorizations and is a component of **MITIGATION MEASURE HYDRO-1**. Through compliance with CWA Section 404/401 regional and project-specific conditions, CDFW LSA/SAA agreement for routine maintenance (or in Nevada, Working in Waterways permit conditions) and TRPA permit conditions, AIP control by dredging would result in less than significant impacts to water quality and beneficial uses. To avoid and reduce potential impacts from AIP control through suction and mechanical dredging to a level of less than significant, **MITIGATION MEASURE HYDRO-1** incorporates project conditions and monitoring and reporting requirements associated with maintenance dredging permits most recently issued in 2015. Implementation of **MITIGATION MEASURE HAZMAT-1**, which requires spill prevention and response, would reduce the risk of new pollutants and contaminants entering the surface waters when motorized vessels and equipment are used for AIP control through dredging.

Through implementation of the stated resource protections measures, **MITIGATION MEASURES HYDRO-1** and **HAZMAT-1**, known potential adverse effects to water quality would be avoided and minimized and the proposed action's benefit to public health and safety would persist. The proposed action would pose no threat of violation of Federal, State or local law or requirements imposed for the protection of the environment (40 CFR 1508.27(b).

Issue - Flood Plains, Wetlands, or Municipal Watersheds

Direct and Indirect Effects

The Project area includes floodplains and wetlands and multiple municipal watersheds. The proposed action would implement aquatic invasive species management strategies that are identified in the 2016 Forest Plan, specifically to control existing or new populations of EWM and CPW. AIP control actions necessitated within floodplains and wetlands would almost always also be located within lands classified as SEZs (LCD 1b). Permanent and temporary disturbance within SEZs is prohibited unless findings for disturbance actions can be met in accordance with Lahontan Basin Plan Chapter 5.2 and TRPA Code Section 30.5; thus avoiding adverse effects to floodplain and wetlands. The proposed action would have no adverse effect on municipal watersheds.

Cumulative Impacts

No adverse cumulative impacts of the proposed action would occur, as AIP control actions would be spread out in multiple areas and over a period of years, resulting in no concentration of action that would cause an adverse cumulative water quality impact. Cumulative effects of the proposed action would beneficially impact habitat quality through reduction of AIP biomass and the coupled release of nutrients to the water body during seasonal die-off, which when unaddressed can cause algal growth and related water quality degradation. AIP control actions would be completed over discrete periods of time at each control site and would comply with federal, state, and regional regulatory authorizations and project conditions through implementation of **MITIGATION MEASURE HYDRO-1** so that a cumulatively considerable impact would not occur. The impact of enacting AIP control in multiple areas around Lake Tahoe, including within tributaries and marshes, would result in a cumulatively beneficial impact through the improvement of water clarity and aquatic habitat maintenance and enhancement.

3.11.5 Environmental Commitments and Mitigation Measures

No mitigation is necessary for AIP control by Hand Removal or for on-going surveillance for identification of new AIP infestation areas and effectiveness monitoring of AIP treatment areas.

In addition to the water quality monitoring and protection measure included in the project description Sections 2.4.3 an 2.4.4, implementation of the control methods would require implementation of permit requirements and conditions as applicable to each method used. Monitoring in relation to water quality includes pre-treatment monitoring, turbidity monitoring, and post-treatment monitoring. Other protection measures integrated into the project include implementation of a Hazards Analysis and Critical Control Plan (HACCP) (Section 2.4.3.4).

MITIGATION MEASURE HAZMAT-1 addresses impacts associated with hazardous materials spills, such as oils or grease used on equipment, containment and remediation.

The hydrology and water quality analyses determine that **MITIGATION MEASURE HYDRO-1** is necessary to avoid and reduce potential impacts to water quality to a level of less than significant.

Mitigation Measure HYDRO-1: Water Quality Compliance and Monitoring

1) **Measures Applicable to All Methods:**
   a) The monitoring and protection measures in Sections 2.4.3 and 2.4.4 in the project description shall be implemented
   b) An HACCP Plan shall be implemented to ensure water quality.
      i) THP samples will be taken for any spill or visible oil sheen. All analysis will be performed by certified laboratory or an approved method of testing, as define by State Statutes, with appropriate reporting limits specific to Tahoe area.
      ii) The permittee shall ensure appropriate best management practices are in place to ensure the removed material is appropriately transported out of the Tahoe Basin. Any potential hazardous material associated with vehicles, boats, motors or diver's supplies, or general removal operations from other potential contaminating material shall be contained and removal, and a spill contingency plan is prepared with appropriate emergency contacts, including nearby water suppliers, are included onsite.
   c) A copy of the applicable permits for the control method used and the HACCPP shall be kept onsite during implementation. Implementing staff and contractors shall be trained on the content and requirements of those documents and shall refer to the requirements throughout implementation. The permittee is responsible for all authorized work and ensuring that all contractors and workers are made aware of and adhere to the terms and conditions of the permit authorization relating to water quality.
   d) Neither Project construction activities nor operation of the Project may cause a violation of the Water Quality Control Plan for the Lahontan Region (Basin Plan); may cause a condition or threatened condition of pollution or nuisance; or cause any other violation of the California Water Code (CWC).
   e) This project is subject to the acquisition of all local, regional, state, and federal permits and approvals as required by law. Failure to meet any conditions contained herein or any conditions contained in any other permit or approval may result in permit revocation and civil or criminal liability.
   f) Shall comply with the Project Conditions of TRPA Permit EIPC2009-0002, as amended or superseded for the control action, and specifically the following:

i) Monitoring: Water quality monitoring will be required to determine the effects of the removal operations and identify possible mitigation measures. Monitoring is for both environmental thresholds (turbidity and clarity) and to protect public drinking water sources. Water quality monitoring for turbidity is also included as a project measure (See Section 2.4.3.2 above). Rather than imposing a specific turbidity level to be maintained directly around the removal operations, the monitoring will be in zones from the work area: Zone 1: This zone closest to the dive operations allows for elevated turbidity within a 25 foot radius of the suction equipment and for levels up to 50 NTU. At levels over 50 operations will cease for 15 minutes OR until levels drop below 25. Zone 2: Turbidity monitoring will also occur at the midpoint between the 25 foot zone and any intake within 0.25 mile from the control site. Any elevation over 10 NTU at this location operation will cease for 15 minutes OR until levels drop below 5. Zone 3: This area within 100 foot of the intake shall not exceed 1 NTU or operations will cease with emergency notification of the closest intake operator followed by NDEP and other operators, and other emergency contacts. Operations will be reviewed and evaluated prior to resumption of work

ii) Bacteria are also a concern for the intakes and while this operation should not increase background levels, sampling will be made within any visible plume.

iii) Turbidity readings shall be recorded regularly during work hours or at a minimum before, during and after suction removal operations. The reading shall be taken at the 25-foot buffer surrounding operations and at the midpoint between the removal and intake lines within 0.25 mile of the control site. Water intakes monitoring will be at the surface and at depth near the withdrawal point.

iv) Disturbance shall be kept to the minimum necessary for operations.

v) All equipment, including boats shall be clean prior to entry into Lake Tahoe. This could be waived for any boat if the operator can show proof of decontamination or use, exclusive to Lake Tahoe.

vi) Drinking water intakes shall be identified and mapped according to the TRPA Code Chapter 60, and comments solicited from the intake operator for proposed actions. The actual location of the drinking water withdrawal is not to be released to any public or private entity due to Homeland Security restrictions.

vii) Removed plant material shall be covered with a tarp or placed in an appropriate device to ensure no plant materials fall into the waterway while transporting plant remnants to the staging area for disposal. Removed plant material shall be appropriately placed in the refuse bins. Any plant material spilled during the transfer from the boat, to the boat camp dock, to the refuse bins shall be raked/picked up and disposed of within the bins provided at the close of each workday.

viii) Following implementation, documentation shall include final maps and project data results and photos of operation, evaluation of any impacts experienced during the removal, and documentation that the plant remnants were removed to a TRPA approved disposal site.

g) Project materials shall be properly stored to avoid spillage into waterways, hazardous materials shall be contained, and debris shall be disposed offsite. No litter or debris shall be dumped into waterways and shall be removed daily and dispose of at an appropriate disposal site.

h) Control methods shall implement the permit conditions established in the permits applicable to that control method as shown in Figure 2-2:

i) Diver Assisted Suction Removal: TRPA Permit, Section 10, CDWF LSAA (CA), and either CA State Lands Lease or NV State Lands Management License.

ii) Benthic Barriers: TRPA Permit, Section 404/NWP 27, Section 401 (Lahontan – CA or NDEP – NV), CDWF LSAA (CA) or NDEP Working in Waterways (NV), and either CA State Lands Lease or NV State Lands Management License.

iii) UVC Light: TRPA Permit and Section 10

iv) LFA: TRPA Permit, Section 404/NWP 5, Section 401 (Lahontan – CA or NDEP – NV), Secti0n 402/NPDES, and CDWF LSAA (CA)

v) Dredging: TRPA Permit, Section 404/NWP 27, TRPA/Lahontan MOU, Section 401 (Lahontan – CA or NDEP – NV), CDWF LSAA (CA) or NDEP Working in Waterways (NV), and either CA State Lands Lease or NV State Lands Management License.

2) **AIP Control Methods that Employ Motorized Boats and Equipment**
   a) All boats and equipment shall be cleaned and appropriately inspected prior to entering any waterway.
      i) Equipment must be clean and free from oil, grease and loose metal material and must be removed from service, if necessary, to protect water quality.
      ii) Petroleum products must be stored in watertight containers with appropriate secondary containment to prevent any spillage or leakage and protected from precipitation and surface run-off.
      iii) Vessels and equipment must be monitored for leaks, and proper BMPs must be implemented should leaks be detected, or the vessel/equipment must be removed from service, if necessary, to protect water quality.
      iv) The Applicant must immediately notify permitting agencies by telephone whenever an adverse condition occurs as a result of discharge. Such a condition includes, but is not limited to, a violation of the permit conditions, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. A written notification of the adverse condition must be provided within two weeks of occurrence. The written notification must identify the adverse condition, describe the actions completed or necessary to remedy the condition, and specify a timetable, subject to any modifications by Water Board staff, for the remedial actions, if not already accomplished.
      v) An emergency spill kit must always be at the Project site during the Project.
   b) Storage of equipment shall occur in designated areas to ensure materials used to operate the equipment is not washed into the waterway and debris is appropriately removed
   c) Permit agency staff will be allowed access onsite to review the permit and inspect equipment and methodology upon presentation of credentials.
   d) During periods of small craft wind advisory, or other hazardous weather advisory, the operation may be curtailed, cancelled, or rescheduled.

3) **AIP Control Methods Requiring Agreement for Work within State Public Right of Way**
   a) For California project locations, requiring a CASLC Lease Agreement, the Applicant shall comply with the following conditions specific to protection of water quality:
      i) Identify whatever provisions are proposed for sewage disposal from boats, commercial uses, etc. If none, please identify the nearest pump-out facility, by name, location, and operating hours.
      ii) Identify whatever provisions are proposed for recycling and/or litter/garbage disposal, including frequency of pick-up.
      iii) Identify any proposed fueling facility and fully describe spill prevention and control features. Are fueling stations such that they are accessible by boat without entering or passing through the main berthing area, in order to avoid collisions? Provide a spill contingency plan and list equipment and training needed to implement the plan.
      iv) Identify the location of any engine and hull washing activities, expected numbers of washings and the types of detergents proposed for use. Only phosphate-free and biodegradable detergents should be used for boat washing.
      v) Describe any proposed pollution control measures for vessel maintenance and haul-out facilities. Examples include:
         - Use of tarps and vacuums to collect solid wastes produced by cleaning and repair of boats. Such wastes should be prevented from entering adjacent water.
         - Vacuum or sweep up and catch debris, sawdust, sandings, and trash from boat maintenance areas on a regular basis so that runoff will not carry it into the water.
         - An oil/water separator should be used on outside drains and be maintained to ensure performance.
         - Tarps should be used to catch spills of paints, solvents, or other liquid materials used in the repair or maintenance of boats.

- Used antifreeze should be stored in a barrel labeled "Waste Antifreeze Only" and should be recycled.

vi) Describe any special measures proposed to control the quality and quantity of urban and other runoff from surrounding areas.

vii) Identification and estimate of amounts and persistence of contaminants which may be released from the sediments during dredging, and during construction and operation and maintenance of the proposed project.

viii) The method and location of disposal of dredged materials.

ix) During dredging operations, indicate how turbidity can be minimized (e.g., through the proper placement of silt screens or turbidity curtains).

x) Statement of the proposed liquid, solid or gaseous waste disposal methods necessary for the protection and preservation of existing land and water uses.

b) For Nevada project locations, requiring a NVDSL State-Owned Submerged Lands Certification, the Applicant shall comply with the following conditions specific to protection of water quality:

i) BMPs shall be applied and precautions shall be taken: to prevent and control releases of debris, sediment, any transport of sediments, and to prevent and control turbidity in the Lake during the project activities.

ii) Disturbance to the lakebed shall be kept to a minimum.

iii) There shall be no discharge of substances that would cause a violation of water quality standards of Lake Tahoe or the State of Nevada.

iv) Any heavy equipment (barge, crane, etc.) to be used in the lake and shorezone areas must be steam cleaned at least once before working in Lake Tahoe or adjacent areas. All equipment shall be cleaned to ensure no contamination of invasive species (i.e. quagga mussels). All equipment shall be inspected for leaks daily prior to use. All leaks shall be repaired immediately. All equipment fueling and storage of fuels shall be conducted offsite and at least 200 feet away from the Lake.

v) If a visible sediment plume or hydrocarbon sheen results from project activities, the work shall cease and NDSL shall be notified as soon as practicable of any release. All hydrocarbon sheens or releases shall be reported to the NDEP Spill Reporting Hotline within 24 hours of occurrence at 1-888-331-6337.

c) For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project including information on the location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented.

4) UV-C Light Treatment

a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 27 authorization under CWA Section 10. Sufficient justification shall be provided to determine that the proposed activity would result in a net increase in aquatic resource functions and services. Functions and services to be considered in the justification include, but are not limited to: cycling of nutrients, retention of particulates, export of organic carbon, and maintenance of plant and animal communities.

b) For Nevada project locations requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented.

c) <u>To ensure control work does not create harmful algal blooms that could pose a risk to humans and animals, visual monitoring for evidence of HABs shall take place following treatment. If site indicators (discolored water, floating algae mats, surface scum, spilled paint appearance on water surface) indicate the potential presence of a HAB, the project proponent should initiate a sampling plan to collect and analyze water samples to determine the presence of harmful algae (cyanobacteria) and any associated cyanotoxins within the treatment area. A tiered analysis approach can be used to determine if cyanotoxins (microcystin, anatoxin-a, and cylindrospermopsin) are present at levels that</u>

may pose health risks to humans and animals. If sampling results indicate that levels of cyanotoxins are present above trigger levels established for the protection of human and animal health, appropriate signage shall be posted to advise recreators of the potential health risks.

d) **To ensure control work does not harm benthic macroinvertebrates, the Water Board may require a BMI survey pre- and post-treatment to ensure there is no long-term adverse impact to the BMI community in the event that UV-C Light treatment is deployed later in the growing season when there is a greater plant biomass being treated.**

e) **To ensure control work does not increase water temperatures, the Water Board may request temperature monitoring with field probes to ensure there are no long-term adverse changes to ambient water temperature that may impact beneficial uses, depending on the size and extent of the UV-C Light treatment.**

5) **Laminar Flow/Aeration**

a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 5 authorization under CWA Section 404 (SPK-2019-00340, as amended or superseded for the control action).

b) For California project locations, shall comply with CWA Section 401 WQC Standard Conditions, and Additional Conditions (Pursuant to CCR Title 23, Section 3859(a)) of Lahontan Water Board Order No. R6T-2020-0032, as amended or superseded.

c) For Nevada project locations, shall submit for CWA Section 401 WQC with NDEP and shall identify implementation of BMPs for avoidance and minimization of impacts to waters of the State, including sediment and erosion control measures, habitat preservation, project scheduling, flow diversions, dewatering, and hazardous materials management. For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project including information on the location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented.

6) **Hand Suction Removal**

a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 27 authorization under CWA Section 10. Sufficient justification shall be provided to determine that the proposed activity would result in a net increase in aquatic resource functions and services. Functions and services to be considered in the justification include, but are not limited to: cycling of nutrients, retention of particulates, export of organic carbon, and maintenance of plant and animal communities

b) For California project locations, shall comply with CWA Section 401 WQC Standard Conditions, and Additional Conditions (Pursuant to CCR Title 23, Section 3859(a)) of Lahontan Water Board Order No. R6T-2020-0032, as amended or superseded (California) for the control action.

c) For Nevada project locations, shall submit for CWA Section 401 WQC with NDEP and shall identify implementation of BMPs for avoidance and minimization of impacts to waters of the State, including sediment and erosion control measures, habitat preservation, project scheduling, flow diversions, dewatering, and hazardous materials management. For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented.

d) Shall implement water quality protection measures required by CDFW LSA/SAA Agreement for Routine Maintenance (1600-2014-0082-R2, as amended or superseded). If conditions arise, or change in such a manner as to be considered deleterious to the stream or wildlife, operations shall cease until approved corrective measures are taken.

e) Shall comply with the Project Conditions of TRPA Permit EIPC2009-0002, as amended or superseded (See 1# above for additional specific requirements). The collected plant material is conveyed to an approved staging area. Hand pulled fragments escaping the vacuum-assisted collection method will be removed by hand/vacuum suction as reasonably practicable before the close of each day.

7) **Benthic Barriers**

a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 27 authorization under CWA Section 404 (SPK-2019-00340, as amended). Sufficient justification shall be provided to determine that the proposed activity would result in a net increase in aquatic resource functions and services. Functions and services to be considered in the justification include, but are not limited to: cycling of nutrients, retention of particulates, export of organic carbon, and maintenance of plant and animal communities.

b) For California project locations, shall comply with CWA Section 401 WQC Standard Conditions, and Additional Conditions (Pursuant to CCR Title 23, Section 3859(a)) of Lahontan Water Board Order No. R6T-2020-0032, as amended or superseded (California) for the control action, and specifically the following:

c) For Nevada project locations, shall submit for CWA Section 401 WQC with NDEP and shall identify implementation of BMPs for avoidance and minimization of impacts to waters of the State, including sediment and erosion control measures, habitat preservation, project scheduling, flow diversions, dewatering, and hazardous materials management. For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project including information on the location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented.

d) Shall implement water quality protection measures required by CDFW LSA/SAA Agreement for Routine Maintenance (1600-2014-0082-R2, as amended or superseded), Permittee shall take precautions to minimize turbidity/siltation during installation and removal of the benthic barriers and during all removal activities. Precautions shall include, but are not limited to: pre-project planning to identify site specific turbidity and siltation minimization measures; best management erosion control practices during project activity; and settling, filtering, or otherwise treating silty and turbid water prior to discharge into a lake or stream.

e) Shall comply with the Project Conditions of TRPA Permit EIPC2009-0002, as amended or superseded.

8) **Hydraulic and Mechanical Dredging**

a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 27 authorization under CWA Section 404 (SPK-2019-00340, as amended), specifically the following conditions:

   i) For all dewatering activities that propose structures or fill in waters of the U.S. that require authorization from the Corps: (1) The proposed methods for dewatering; (2) The equipment that would be used to conduct the dewatering; (3) The length of time the area is proposed to be dewatered; (4) The area (in acres) and length (in linear feet) in waters of the U.S. of the structure and/or fill; (5) The method for removal of the structures and/or fill; and (6) The method for restoration of the waters of the U.S. affected by the structure or fill following construction.

   ii) Sufficient justification to determine that the proposed activity would result in a net increase in aquatic resource functions and services. Functions and services to be considered in the justification include, but are not limited to: cycling of nutrients, , retention of particulates, export of organic carbon, and maintenance of plant and animal communities.

   iii) Unless determined to be not practicable by the Corps, no dredged and/or fill material shall be discharged within standing or flowing waters. For ephemeral or intermittent drainages (e.g. natural or relocated streams, creeks, rivers), this may be accomplished through construction during the dry season. In perennial drainages, this may be accomplished through dewatering of the work area. All dewatering shall be conducted to allow fish and wildlife passage during construction. All dewatering structures and/or fills shall be removed within 30 days following completion of construction activities in waters of the U.S.

b) For California project locations, shall comply with CWA Section 401 WQC Standard Conditions, and Additional Conditions (Pursuant to CCR Title 23, Section 3859(a)) of Lahontan Water Board Order No. R6T-2020-0032, as amended or superseded (California) \

c) For Nevada project locations, shall submit for CWA Section 401 WQC with NDEP and shall identify implementation of BMPs for avoidance and minimization of impacts to waters of the State, including sediment and erosion control measures, habitat preservation, project scheduling, flow diversions, dewatering, and hazardous materials management. For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented.
d) Shall implement water quality protection measures required by CDFW LSA/SAA Agreement for Routine Maintenance (1600-2014-0082-R2, as amended or superseded), specifically the following:
e) Additional project conditions and monitoring and reporting for AIP control by Hydraulic and Mechanical Dredging shall include:
    i) Monitoring and Reporting shall be conducted in compliance with the Marina General Permit, where applicable.
    ii) Water Board staff must be notified a minimum of forty-eight hours prior to commencing dredging.
    iii) Turbidity curtains shall be used during implementation to effectively contain and isolate wastes from dredging and prevent turbidity from lakebed sediments outside the containment area.
    iv) In marinas where the Marina General Permit is applicable, the Applicant shall provide to the Water Board a report prior to project initiation, acceptable to the Executive Officer, which includes pre-dredging monitoring results, AIP survey results, and a utility avoidance plan.
    v) If a sediment plume is visible at any time outside of the turbidity curtain, the Applicant shall immediately cease dredging operations, measure the turbidity within the plume area, and implement measures to eliminate the discharge. The Applicant shall also delineate the size of the area by visually documenting the extent of the plume with photographs. Turbidity measurements may be taken with a hand-held field meter. The sample location and sample results shall be recorded in a logbook and emailed to the Water Board at Lahontan@waterboards.ca.gov within 12 hours of taking the turbidity measurement.
    vi) Dredging operations shall immediately cease if inclement weather or wave and/or wind action threatens to cause suspended sediment discharges to spread turbidity beyond the curtained dredging area. The Applicant shall take immediate action to ensure that turbidity outside the curtained containment area is kept to a minimum at all times, even in adverse conditions, such as high winds, wave action or currents.
    vii) The turbidity curtain shall not be removed until Water Board staff verifies monitoring results demonstrating that the turbidity within the Project area do not exceed 3 NTU or the background turbidity levels, whichever is higher.
    viii) Excavators, if used, shall be steam cleaned prior to use.
    ix) Construction and mechanical equipment shall be monitored for leaks, and removed from service, if necessary, to protect water quality. Mechanical equipment that must be submersed in Lake Tahoe during the dredging operation shall be steam-cleaned and inspected for leaks prior to use.
    x) The use of chitosan or any flocculent to reduce turbidity in the lake is prohibited.

3.12 LAND USE AND PLANNING

3.12.1 Setting

The Project Area includes shoreline and marinas within Lake Tahoe, tributaries to the lake, including the Truckee and Upper Truckee Rivers, and area marshes. This also includes beaches and public access points, with some parking areas possibly used for material staging. The Project may occur on land under the jurisdiction of California and Nevada, the Forest Service, and local governments, as well as private property.

Projects within the Lake Tahoe Region within the jurisdiction of the TRPA are subject to the TRPA Regional Plan, which is a regulatory framework encompassing the Rules of Procedure, Goas and Policies, the Code of Ordinances, environmental threshold carrying capacities, the Regional Transportation Plan, the Environmental Improvement Program, and Area Plans, Community Plans and Plan Area Statements. Land use goals and policies for specific areas within the region are found in the Area Plans, Community Plans, and Plan Area Statements, while broader land use goals, policies, and regulations are contained in the Code of Ordinances and Goals and Policies.

The TRPA Code of Ordinances (Chapter 21) defines permissible land uses in the Lake Tahoe Basin. Each of the potential treatment areas allows for the treatment and removal of invasive plant species. Within the shorezone (Chapter 81), AIP control activities are categorized as "Fish habitat restoration" uses, while in the upland areas the activities are categorized as "non-structural fish habitat management". Nonstructural fish habitat management is defined as: Habitat management that maintains or improves fish habitat of any species through non-structural means for the primary purpose of perpetuating the cold water fisheries resource through management of their habitat. Includes stream barrier removal, human access control, protection and enhancement of riparian vegetation, and beaver control.

The control methods are defined as Non-structural Fish Habitat Management upland of the shorezone and Fish Habitat Restoration within the shorezone. Fish Habitat Restoration is a special use within the Shoreline Ordinance (TRPA Code of Ordinances Chapter 81). Non-structural Fish Habitat Management is allowed within each Plan Area Statement of the Project Area. Allowed uses are assumed to be compatible with the direction of the Regional Plan and the surrounding uses. Section 63.3.1.C of the TRPA Code of Ordinances also indicates that lake habitat shall be protected and that habitat restoration projects may be permitted in the nearshore or foreshore.

Portions of the Project Area are within the South Tahoe ALUCP Airport Safety zones, including Zone 1 located at the end points of the runway. While SEZ restoration is allowed in Zone 1, non-structural fish habitat management is not allowed. Each of the other Safety Zones conditionally allow both nonstructural fish habitat management and SEZ restoration.

3.12.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct or indirect effects to land uses of the Project Area.

3.12.3 Environmental Impacts of the Proposed Action Alternative

Table 3.12-1: Land Use and Planning

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.12-1. Physically divide an established community? (CEQA XIa)				X
3.12-2. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? (CEQA XIb)			X	

TRPA Initial Environmental Checklist Item	Yes	No, With Mitigation	Data Insufficient	No
3.12-3. Include uses which are not listed as permissible uses in the applicable Plan Area Statement, adopted Community Plan, or Master Plan? (TRPA 8a)				X
3.12-4. Expand or intensify an existing non-conforming use? (TRPA 8b)				X

Discussion

3.12-1. Would the Project physically divide an established community? (CEQA XIa)

No Impact. The Project Area is within Lake Tahoe, the Upper Truckee River, the Truckee River, and area marshes, and would not physically divide an established community. Temporary treatment activities would occur within these existing waterways and access to these waterways would be maintained. The treatment activities would not physically divide the community.

Depending on the location of the activity, permits, access easements, or lease agreements may be required to conduct the AIP control activity or access the control site as discussed in Section 1.5 and listed in the permitting tables in the Project Description. Implementation of the control activity would be subject to the terms and conditions of each permitting agency (CSLC Lease Agreement, NDSL Certification, CDPR encroachment permit, etc.).

3.12-2. Would the Project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? (CEQA XIb)

Less than Significant Impact. Appropriate interagency coordination, consultation, and permits would be completed or obtained, in compliance with applicable local, state, and federal requirements. No Project elements are in conflict with the zoning, regulatory policies, land use plans, conservation plans, or ordinances for the Lake Tahoe Basin and no incompatibilities between the Project and existing plans or ordinances have been identified. The Project would remove non-native, invasive plant species consistent with goals of the TRPA Regional Plan and local area plans that control land use along the shoreline of Lake Tahoe and along the Truckee River. The proposed control methods, which are consistent with the zoning and compatible with the surrounding uses, result in no impact to land use or conflict with policies or regulations adopted to mitigate environmental effects. Improving lake clarity would support the adopted land use plans, goals, and policies.

TRPA Code of Ordinances, Chapter 84, addresses Shorezone and Lakezone projects. General findings require that the project does not adversely impact littoral processes, fish spawning, backshore stability, or on-shore wildlife habitat. Dredging is considered a project under Chapter 84 and requires findings and compliance with TRPA's dredging BMPs.

3.12-3. Will the Project include uses which are not listed as permissible uses in the applicable Plan Area Statement, adopted Community Plan, or Master Plan? (TRPA 8a)

No. The control methods are not permanent land uses, but are mitigating actions to maintain lake clarity and function. The control methods are defined as Non-structural Fish Habitat Management upland of the shorezone and Fish Habitat Restoration within the shorezone. Fish Habitat Restoration is a special use within the Shoreline Ordinance (TRPA Code of Ordinances Chapter 81). Non-structural Fish Habitat Management is permissible within each Plan Area Statement of the Project Area.

3.12-4. Will the Project expand or intensify an existing non-conforming use? (TRPA 8b)

No. The project proposes a variety of temporary aquatic invasive plant control methodologies to be used in various locations for the improvement of water clarity and ecological function. No permanent uses are proposed.

3.12.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Land use impacts are evaluated in terms of NEPA Intensity Factors 2 and 3. This EA supports implementation of Forest Plan Standards SG147 and SG148 which is used to inform a subsequent Decision Memo on the proposed action.

Issue - Encroachment of Treatment Activities onto Forest Service or Other Federally Managed Areas

Direct and Indirect Effects

The proposed action may be located within LTBMU managed land or access to the control sites or treatment staging may need to occur on LTBMU-managed lands, or within other areas managed by federal agencies such as the USACE. AIP control efforts, access, and staging in areas managed by the LTBMU or other federal agencies, if approved under the Decision Notice, would not be required to obtain a Special Use Permit, and this analysis would be used to support the necessary permits from other agencies as set forth in Section 1 of this document. No permanent structures are proposed, and no control methods would result in a change to the land use or conflict with the Forest Plan. The action would help to sustain native vegetation and habitat by removing invasive aquatic species and would therefore have a beneficial impact in relation to Forest Plan Directives and Standards. No structures or permanent alteration to land is proposed. The project would not alter or impact land use standards or regulations. Implementation of the project may temporarily limit public access to LTBMU-managed areas along Lake Tahoe and affected tributaries and marshes while AIP control methods are in use. In most cases, only a portion of an areas would have limited access or access may be unavailable during a limited implementation period. To address those limitations, project activities may be scheduled during weekdays or evenings when visitation is lower. However, since control sites can be split into smaller segments and do not occupy the full extent of public accessibility, complete closure of LTBMU-managed areas would not occur. While some affect may occur, it is not likely to adversely affect access as discussed further under recreation.

Cumulative Impacts

The treatment methods are not used permanently other than long-term monitoring, which does not affect land use or public access. Although multiple LTBMU-managed areas could be affected, the effects would be spread out over so as not to cause a cumulative effect. Other projects in the area include other AIS control activities, pier and buoy improvements or relocation, Upper Truckee rafting permits, ferry service on Lake Tahoe, and marina maintenance dredging, little of which may be located on LTBMU-managed lands; therefore, there are no cumulative impacts of the proposed action in relation to land use.

3.12.5 Environmental Commitments and Mitigation Measures

The land use analysis determines no mitigation measures are necessary.

3.13 MINERAL AND NATURAL RESOURCES

3.13.1 Setting

For purposes of CEQA analysis, "mineral resources" refers to aggregate resources, which consist of sand, gravel and crushed rock. The State Mining and Geology Board classifies mineral deposits through maps and report at: http://www.conservation.ca.gov/cgs/minerals/mlc/Pages/Index.aspx. The map and accompanying text provides general information about the current availability of California's permitted aggregate resources. The map compares projected aggregate demand for the next 50 years with currently permitted aggregate resources in 31 regions of the state. The map also highlights regions where there are less than 10 years of permitted aggregate supply remaining.

There are currently no important mineral resources identified in the Project Area. Commercial mineral resource extractions are restricted due to impacts to resources and in accordance with the PRC Section 5001.65.

In this case, TRPA addresses "natural resources" as any renewable or non-renewable natural resource, which includes wood materials, minerals and metals, gasoline, and other consumed materials.

3.13.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities, and therefore, would result in no direct or indirect effects to mineral or other natural resources.

3.13.3 Environmental Impacts of the Proposed Project Alternative

Table 3.13-1: Mineral and Natural Resources				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.13-1. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? (CEQA XIIa)				X
3.13-2. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? (CEQA XIIb)				X
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.13-3. A substantial increase in the rate of use of any natural resources? (TRPA 9a)				X
3.13-4. Substantial depletion of any non-renewable natural resource? (TRPA 9b)				X

Discussion

3.13-1. Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? (CEQA XIIa)

No Impact. The Project is not located in Mineral Resource Zones 1 through 4 classification areas. No significant mineral resources have been identified within the boundaries of the Project Area. The Project would not change land use activities in control site areas and would therefore not result in the loss of availability of a known mineral resource or a locally important mineral resource recovery site. As stated in the Environmental above, under PRC Section 5001.65, mining within any unit of the State Park System is prohibited.

3.13-2. Would the Project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? (CEQA XIIb)

No Impact. The Project Area does not contain an economically feasible extraction operation.

3.13-3. Will the Project result in a substantial increase in the rate of use of any natural resources? (TRPA 9a)

No. The temporary control methods would not substantially increase the rate of use of natural resources. While some fuel consumption would occur to temporarily operate equipment and machinery, the volume of fuel used would not be substantial.

3.13-4. Will the Project result in a substantial depletion of any non-renewable natural resource? (TRPA 9b)

No. The control methods would not substantially increase the rate of use of natural resources. While some fuel consumption would occur to temporarily operate equipment and machinery, the volume of fuel used would not be substantial.

3.13.4 NEPA Analysis of Effects

No mineral extraction is proposed, and no mineral resources are present; therefore, the project has no direct, indirect, or cumulative effects.

3.13.5 Environmental Commitments and Mitigation Measures

The mineral and natural resource analysis determines no mitigation measures are necessary as no impact occurs.

3.14 NOISE

3.14.1 Setting

The Project Area is located within Lake Tahoe and its associated marshes and tributaries. Activities would be conducted from a boat, barge, or from equipment based on land or docking and treatment actions would occur underwater. The Project Area is characterized by a natural setting which is often free of loud noise; however, boat traffic can be very heavy at times and noise can travel great distances over the flat lake surface. The treatment area along the Upper Truckee River near the airport and marina areas experience greater noise than marshes or other areas around the lake.

Sound is any detectable fluctuation in air pressure and generally is measured on a logarithmic scale in decibels (dB). When unwanted sound (i.e., noise) is measured, an electronic filter is used to de-emphasize extreme high and low frequencies to which human hearing has decreased sensitivity. Resulting noise measurements are expressed in weighting frequencies called A-weighted decibels (dBA). While zero dBA is the low threshold of human hearing, a sustained noise equal or greater than 90 dBA is painful and can cause hearing loss (Table 3.13-1, Bearden 2000).

Noise is further described according to how it varies over time and whether the source of noise is moving or stationary. Background noise in a particular location gradually varies over the course of a 24-hour period with the addition and elimination of individual sounds. Several terms are used to describe noise and its effects. The equivalent sound level (L_{eq}) describes the average noise exposure level for a specific location during a specific time period, typically over the course of one hour. The Community Noise Equivalent Level (CNEL) is a twenty-four hour average of L_{eq} with an additional 5 dBA penalty for noise generated between the hours of 7:00 p.m. and 10:00 p.m. and a 10 dBA penalty during the hours of 10:00 p.m. and 7:00 a.m. The penalties account for how much more pronounced a noise is at night when other sounds have diminished. Federal, state, and local governments have defined noise and established standards to protect people from adverse health effects such as hearing loss and disruption of certain activities. Noise is defined in the California Noise Control Act, Health and Safety Code, California Code of Regulations (CCR) Section 46022 as excessive or undesirable sound made by people, motorized vehicles, boats, aircraft, industrial equipment, construction, and other objects.

Table 3.14-1

Sound Levels Generated by Various Sources of Noise

Sound Level	**dBA**
Quiet library, soft whispers	30
Living room, refrigerator	40
Light traffic, normal conversation, quiet office	50
Air conditioner at 20 feet, sewing machine	60
Vacuum cleaner, hair dryer, noisy restaurant	70
Average city traffic, garbage disposals, alarm clock at 2 feet	80
Constant exposure to the following sound levels can lead to hearing loss	
Subway, motorcycle, truck traffic, lawn mower	90
Garbage truck, chain saw, pneumatic drill	100
Rock band concert in front of speakers, thunderclap	120
Gunshot blast, jet plane	140
Rocket launching pad	180

Source: Bearden 2000

TRPA has two sets of standards, one for single noise events and one for cumulative noise events in the community. Single noise events are identified by source such as aircraft, watercraft, vehicles, snowmobiles, and the like. Cumulative noise sources are identified by land use category such as high and low density residential, commercial, industrial, urban/rural outdoor recreation, wilderness/roadless areas, and wildlife areas. Thresholds are set in dBA based on threshold noise for single noise events and average of background noise levels for cumulative noise events. Watercraft shall meet each of the following separate threshold measurement standards:

1. Certification by the manufacturer or by TRPA approved field test agent that the watercraft passes the Society of Automotive Engineers test J34 or SAE-J34, Pass by Test, 82.0 dBA to be measured at 50 feet with the engine at 3,000 RPM;
2. Field test measurements that the watercraft passes the Society of Automotive Engineers test J1970 or SAE-J1970, Shoreline Test, 75 dBA; and

3. Field test measurements that the watercraft passes the Society of Automotive Engineers test J2005, Stationary Test, 88 dBA if watercraft manufactured on or after January 1, 1993 and 90 dBA if watercraft manufactured before January 1, 1993.

The South Lake Tahoe Airport is located within the Project Area's southern boundary as treatment may occur along the reaches of the Upper Truckee River along the airport runway. TRPA thresholds are also established for aircraft noise:

> Departures: 80 dBA at 6,500 meters from start to takeoff roll. 77.1 dBA at 6,500 meters from start to takeoff roll between 8 pm and 8 am.
>
> Arrivals: 84 dBA at 2,000 meters from the runway threshold approach (general aviation and commuter aircraft). 86 dBA at 2,000 meters from the runway threshold approach (transport category aircraft). 77.1 dBA (all aircraft) 2,000 meters from the runway threshold approach between 8 pm and 8 am.

TRPA Code of Ordinances Section 68.3.1.A further indicates daytime arrival standards for transport, commuter, and all other aircraft is 86 dBA (Lmax), 84 dBA (Lmax), and 80 dBA (Lmax), respectively.

TRPA Code of Ordinances Section 68.9 establishes exemptions to noise limitations and states that TRPA-approved construction or maintenance projects are exempt if activities are limited to between the hours of 8 am and 6:30 pm.

3.14.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct or indirect effects from noise.

3.14.3 Environmental Impacts of the Proposed Action Alternative

Table 3.14-2: Noise

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.14-1. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or other applicable local, state, or federal standards? (CEQA XIIIa)			X	
3.14-2. Generation of excessive groundborne vibration or groundborne noise levels? (CEQA XIIIb)			X	
3.14-3. For a Project within the vicinity of a private airstrip or an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project		X		

area to excessive noise levels? (CEQA XIIIc)				
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.14-4. Increases in existing Community Noise Equivalency Levels (CNEL) beyond those permitted in the applicable Plan Area Statement, Community Plan or Master Plan? (TRPA 6a)				**X**
3.14-5. Exposure of people to severe noise levels? (TRPA 6b)				**X**
3.14-7. Single event noise levels greater than those set forth in the TRPA Noise Environmental Threshold? (TRPA 6c)				**X**
3.14-7. The placement of residential or tourist accommodation uses in areas where the existing CNEL exceeds 60 dBA or is otherwise incompatible? (TRPA 6d)				**X**
3.14-8. The placement of uses that would generate an incompatible noise level in close proximity to existing residential or tourist accommodation uses? (TRPA 6e)				**X**
3.14-9. Exposure of existing structures to levels of ground vibration that could result in structural damage? (TRPA 6f)				**X**

Discussion

3.14-1. Would the Project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or other applicable local, state, or federal standards? (CEQA XIIIa)

Less than Significant Impact. Project activities requiring use of a boat, winch, and/or backhoe could produce noise in excess of typical noise in the area; however, noise related to project activities will be temporary in nature, and temporary increases in noise levels along the shoreline of Lake Tahoe frequently occur as a result of substantial watercraft recreation. Because of the small engines used by the pumps for diver-assisted suction removal of plants, noise generated by these project activities will not violate any established noise standards established by the Tahoe Regional Planning Agency or other local, state, or federal standards. Boats used for UVC light treatment or platforms used for diver assisted suction treatment also would not produce significant noise, nor would hand installation of benthic barriers or aeration systems. Air compressors associated with the aeration systems would be housed within an existing marina mechanical room or other enclosure to discourage theft, and noise generated by the air compressors would not be significant. Dredging operations have the potential to create the most noise as heavy machinery would be used. However, dredging is categorized as maintenance activity and would occur over a brief period. Dredging activity would be required to occur between 8 am and 6:30 pm to comply with TRPA noise exemption standards and would not be considered a significant impact. The noise generated by project activities will result in a less than significant impact in regard to public exposure to elevated noise levels.

3.14-2. Would the Project generate excessive groundborne vibration or groundborne noise levels? (CEQA XIIIb)

Less than Significant Impact. Equipment use would create temporary and periodic vibration effects in the Project Area, but would not expose persons to excessive groundborne vibration or noise levels. The Project does not include fulltime or backup generator power for operations. Aeration system air compressors would be used, but would be enclosed and would connect to standard existing electrical connection and are not of a size or type to create significant vibration. Dredging would be limited to marinas where dredging has previously occurred for maintenance. Because of control site locations, Project activities would not result in excessive groundborne vibrations or noise levels. No impact.

3.14-3. For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels? (CEQA XIIIc)

Less than Significant with Mitigation Measures. The Project is located within the vicinity of Lake Tahoe Airport and therefore creates the potential to expose treatment personnel working in the Upper Truckee River near the airport to excessive noise levels from air traffic. Work within the tributaries of the Upper Truckee River near the airport would consist of monitoring, hand pulling, or possibly the use of benthic barriers if infestations are found to be significant. While the Upper Truckee River approximately 200 feet east of the runway and outside airport property is somewhat buffered and the area is accessed by recreational users, a small channel offset of the Upper Truckee River is located on the airport property west of the taxiway and approximately 300 feet of the runway. When working in these areas treatment personnel may be required to wear hearing protection. Implementation of **MITIGATION MEASURE HAZMAT-2,** which requires coordination with Lake Tahoe Airport and implementation of a safety plan per Lake Tahoe Airport requirements, would mitigate this impact. Personnel would be required to follow the safety protocol of all persons working at the airport, including the use of noise safety devices. No permanent structures or long-term work would occur in this area.

3.14-4. Would the Project result in increases in existing Community Noise Equivalency Levels (CNEL) beyond those permitted in the applicable Plan Area Statement, Community Plan, or Master Plan? (TRPA 6a)

No. The Project involves a variety of AIP control methods that would be used periodically from May to November over a period of years. Not all control methods would be implemented simultaneously or within the same area, therefore, treatment would be spread out both in physical location and in time. The different control methods produce varying degrees of noise with monitoring and hand pulling producing little noise and dredging producing higher volumes of noise since excavating construction equipment would be used. Since the activities are maintenance activities to enhance water clarity and native habitat, the activity would be exempt from noise thresholds if the activity is limited to between the hours of 8 am and 6:30 pm. Additionally, the treatment activity would occur over a brief period of a few days in a year, and would not occur extensively enough to exceed the community CNEL.

3.14-5. Would the Project result in exposure of people to severe noise levels? (TRPA 6b)

No. As discussed above, different control methods would produce different levels of noise. Most methods would produce little noticeable noise, particularly since AIP removal occurs beneath the surface of the water. Dredging methods can produce higher noise levels, however, dredging would be limited to marina areas where dredging has previously occurred. Marinas are areas that regularly experience higher levels of noise from watercraft use and associated marina equipment use. Dredging would occur over a period of a few days with machinery use limited to daytime construction hours (8 am to 6:30 pm). While the equipment use would produce higher noise levels, marina use would decrease during the active dredging process, thereby offset by noise regularly created by watercraft and avoiding a cumulative increase in noise levels. No significant impact is anticipated as noise levels would be similar to average construction activities and no sensitive receptors are located at the marinas.

3.14-6. Will the Project result in single event noise levels greater than those set forth in the TRPA Noise Environmental Threshold? (TRPA 6c)

No. The loudest activity, dredging would result in noise no greater than standard construction activities with the use of a single excavator. Such activity would be limited to marinas in which dredging has previously occurred and would be limited to daytime construction hours (8 am to 6:30 pm). No blasting or other intense noise or vibration-causing activity is proposed. No impact would occur.

3.14-7. Will the Project result in the placement of residential or tourist accommodation uses in areas where the existing CNEL exceeds 60 dBA or is otherwise incompatible? (TRPA 6d)

No. The Project does not propose residential or tourist accommodation uses. No impact.

3.14-8. Will the Project result in the placement uses that would generate an incompatible noise level in close proximity to existing residential or tourist accommodation uses? (TRPA 6e)

No. No activities are proposed in close proximity to residential or tourist accommodation uses. Most control methods would produce little noise and would not be audibly noticed. Dredging would produce noise, but would be limited to marina areas where dredging has previously occurred. Furthermore, dredging would occur over a period of a few days within the treatment plan period and would occur during daytime construction hours (8 am to 6:30 pm). Due to the location of dredging and limited timing of the activity, no significant impact would occur.

3.14-9. Will the Project expose existing structures to levels of ground vibration that could result in structural damage? (TRPA 6f)

No. See the response to Question 3.14-2, above.

3.14.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Noise impacts are evaluated in terms of NEPA Intensity Factors 2 and 10.

Issue - Expose Persons to Excessive Noise

Direct and Indirect Effects

The proposed action would result in increased noise levels if dredging control methods are used. Noise emissions from the dredging excavator can produce elevated noise levels; however, regular marina noise levels from marina equipment and boats would be reduced while dredging occurs. Dredging would be limited to daytime hours. Since the other control methods would produce very little noise, impacts to quieter habitat areas in marshes and tributaries would be insignificant and no greater than regular recreational noise in those areas. Likewise, implementation of those methods at night would not exceed noise thresholds. No noise thresholds would be exceeded and people would not be exposed to excessive noise levels or vibration. Therefore, project implementation is consistent with local noise thresholds and Forest Plan Standard SG124.

Cumulative Impacts

Due to the temporary nature of project control implementation, and the low levels of noise created by each control method other than dredging, cumulative impacts of the proposed action would be less than significant. Most control methods produce little noise and dredging methods that produce noise would be located in marinas. While dredging occurs, boater and marina noise would be reduced, thereby maintaining noise output with little increase in noise level. Other cumulative projects are spread throughout the area, resulting in little cumulative compounding of noise in an area, and the noise dissipates over distance, thereby avoiding a cumulative increase that could exceed noise thresholds. Therefore, noise impacts would not be cumulatively considerable.

3.14.5 Environmental Commitments and Mitigation Measures

The noise analysis determines no mitigation measures would be necessary other than **MITIGATION MEASURE HAZMAT-2** to ensure treatment personnel hearing safety if work occurs within the channels of the Upper Truckee River on and adjacent to the airport property.

3.15 POPULATION AND HOUSING

3.15.1 Setting

In 2010, the population within the Lake Tahoe Basin (California and Nevada) was approximately 56,000 people (TMPO and TRPA, Lake Tahoe Basin Census Trends Report 1990-2000-2010, 2013). More recent information (Linking Tahoe: Regional Transportation Plan; TRPA 2017) indicates that the year round population of the Tahoe Region is 55,000 persons. The full-time population in the area has decreased since 2000, but is currently relatively stabilized at 55,000 residents. Tourist populations, however, continue to grow and fluctuate seasonally. The Lake Tahoe Basin is traditionally a vacation or second-home area, with many homeowners maintaining their primary residency outside of the region.

3.15.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct or indirect effects housing or population.

3.15.3 Environmental Impacts of the Proposed Action Alternative

Table 3.15-1: Population and Housing				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.15-1. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? (CEQA XIVa)				X
3.15-2. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? (CEQA XIVb)				X
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.15-3. Alter the location, distribution, density, or growth rate of the human population planned for the Region? (TRPA 11a)				X
3.15-4. Include or result in the temporary or permanent displacement of residents? (TRPA 11b)				X

3.15-5. Affect existing housing, or create a demand for additional housing? To determine if the proposal will affect existing housing or create a demand for additional housing, please answer the following questions: (1) Will the proposal decrease the amount of housing in the Tahoe Region? (2) Will the proposal decrease the amount of housing in the Tahoe Region historically or currently being rented at rates affordable by lower and very-low-income households? (TRPA 12a)				**X**
3.15-6. Will the proposal result in the loss of housing for lower-income and very-low-income households? (TRPA 12b)				**X**

Discussion

3.15-1. Would the Project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? (CEQA XIVa)

<u>No Impact</u>. The Project will require between 2 and 4 temporary workers at each control site during implementation. Based on the small number of workers, and the seasonal and temporary duration of the work, the Project would not directly or indirectly induce growth. No impact.

3.15-2. Would the Project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? (CEQA XIVb)

<u>No Impact</u>. The Project displaces no people or housing and thus does not necessitate the construction of replacement housing. The Project does not have a housing component and work would take place within the Lake Tahoe shorezone and within the banks of the Truckee and Upper Truckee Rivers, with no additions or changes to existing local infrastructure. The Project would neither modify nor displace any existing housing and would displace no people, either temporarily or permanently. Jobs created by the Project would be tied to short-term project related activities and would be temporary in nature. Visitation to the area is not expected to change as a result of the Project. No impact.

3.15-3. Will the Project alter the location, distribution, density, or growth rate of the human population planned for the Region? (TRPA 11a)

<u>No.</u> See discussion and analysis for Question 3.15-1 above. No impact

3.15-4. Will the Project include or result in the temporary or permanent displacement of residents? (TRPA 11b)

<u>No.</u> See discussion and analysis for Question 3.15-2 above. No impact

3.15-5. Will the Project affect existing housing, or create a demand for additional housing?

(1) Will the proposal decrease the amount of housing in the Tahoe Region? (2) Will the proposal decrease the amount of housing in the Tahoe Region historically or currently being rented at rates affordable by lower and very-low-income households? (TRPA 12a)

No. See discussion and analysis for Questions 3.15-1 and 3.15-2 above. No impact

3.15-6. Will the Project result in the loss of housing for lower-income and very-low-income households? (TRPA 12b)

No. See discussion and analysis for Question 3.15-2 above. No impact

3.15.4 NEPA Analysis of Effects

Since the Proposed Action would not affect housing or recreational residence facilities and would not induce population growth that would increase demand for housing or recreational residences, no effect would occur directly, indirectly, or cumulatively.

3.15.5 Environmental Commitments and Mitigation Measures

The population and housing analysis determines that no mitigation measures would be necessary as no impacts to housing and population would result from implementation of this Project.

3.16 PUBLIC SERVICES

3.16.1 Setting

Public services include fire and police protection, schools, parks, and other public facilities. The control sites benefit from existing public services, such as fire and law enforcement protection.

Fire Protection. California state park units in the Tahoe Basin are located on State Responsibility Land in Placer and El Dorado Counties. The California Department of Forestry and Fire Protection (CalFire) has primary jurisdiction for fire suppression in State Responsibility Land including units of the State Park System (CalFire 2007). Approximately 80 percent of the lands within the Tahoe Basin are owned and managed by the LTBMU. CalFire has an agreement with the LTBMU to provide fire protection to State Responsibility Lands in the Basin.

The size of the state and the numerous types of emergencies such as wildfires, floods, and earthquakes, require the cooperative efforts of federal, state, and local agencies. The LTBMU provides service to the entire Lake Tahoe Basin in California and Nevada. The Fire Protection Districts within Tahoe Basin work cooperatively with LTBMU and adjacent Fire Protection Districts.

The Nevada Division of Forestry provides wildfire protection statewide through its Wildland Fire Protection Program, which was approved by the Nevada State Legislature in 2013. The program was developed to defend the people and lands of Nevada against wildland fire through collaborative and comprehensive use of fire suppression, prevention and restoration resources available through the state. It works to address current challenges facing federal, state, and local governments which include fighting year-round wildland fires, escalating fire suppression costs, cheatgrass and other invasive species, expanding Wildland Urban Interfaces, scattered capabilities and jurisdictions, tight budgets, and declining federal resources and cost shifting.

The Wildland Fire Protection Program allows the State to provide financial assistance with wildland fire costs, increased suppression resources and coordination, incident management assistance, and technical expertise to participating counties during a wildfire. The Division also operates under cooperative agreements with federal agencies and other states.

Police Protection. California and Nevada Park Rangers assigned to lands within the Lake Tahoe Basin are Peace Officer Standards and Training certified law enforcement officers and provide year round law enforcement within park unit boundaries. The County Sheriff Departments respond to emergency calls and assist with criminal investigations. LTBMU provides Law Enforcement Officers to address incidents on National Forest Lands. The United States Coast Guard maintains legal authority on the waters of Lake Tahoe. TRPA also maintains enforcement presence on Lake Tahoe for boating, scenic quality and design standard regulations.

Schools. No schools are located within the Project Area; however, various schools are nearly a quarter mile of potential control sites, including Cold Stream Alternative School, Tahoe Lake Elementary School, Kings Beach Elementary, and Zephyr Cove Elementary.

Parks and Other Public Facilities. Many parks and recreational facilities that serve local residents and visitors are located adjacent to and provide access to the Project Area. Such parks, recreational facilities, and access areas are managed by CDPR, Nevada State Parks, LTBMU, City of South Lake Tahoe, North Tahoe Public Utility District, California Tahoe Conservancy and various other agencies.

3.16.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct or indirect effects public services.

3.16.3 Environmental Impacts of the Proposed Action Alternative

Table 3.16-1: Public Services

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.16-1. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?				X
Police protection?				X
Schools?				X
Parks?				X
Other public facilities? (CEQA XVa)				X

TRPA Initial Environmental Checklist Item	Yes	No, With Mitigation	Data Insufficient	No
Will the proposal have an unplanned effect upon, or result in a need for new or altered governmental services in any of the following areas?				
3.16-2. Fire protection? (TRPA 14a)				X
3.16-3. Police protection? (TRPA 14b)				X
3.16-4. Schools? (TRPA 14c)				X
3.16-5. Parks or other recreational facilities? (TRPA 14d)				X
3.16-6. Maintenance of public facilities, including roads? (TRPA 14e)				X
3.16-7. Other governmental services? (TRPA 14f)				X

Discussion

The Project would not require additional public services and thus creates no impact to acceptable service ratios, response times or other performance objectives.

3.16-1. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire protection? Police protection? Schools? Parks? Other public facilities? (CEQA XVa)

No Impact.

Fire Protection. No components of the Project would contribute to an increase of visitation and the long-term level of required public services will not change due to project activities. No impact.

Police Protection. Park rangers patrol California and Nevada parklands and USFS Law Enforcement Officers patrol National Forest Lands in the Lake Tahoe Basin with emphasis on campgrounds and public use areas. Rangers and LEOs have full law enforcement authority and are only assisted form local police as backup as needed. The Counties and US Coast Guard have law enforcement authority on Lake Tahoe. No additional demands on rangers, LEOs, local police or the US Coast Guard are expected as a result of this Project. No impact.

Schools, Parks and Other Public Facilities. There would be no impacts to schools or other public facilities as a result of the Project and no need for new or physically altered governmental facilities related to these services. Access into control sites (some of which are located in private and public recreational sites) via boat may be restricted for short periods of time during barrier installation and removal to ensure safety of the divers; however, the limited duration of the restricted access, and availability of the rest of the lake for recreation would result in less than significant impacts. Roads and other public infrastructure would not be affected or in need of repair or replacement as a result of this project.

3.16-2. Will the Project have an unplanned effect upon, or result in a need for new or altered governmental services: fire protection? (TRPA 14a)

No. See discussion and analysis for Question 3.16-1 above. No impact.

3.16-3. Will the Project have an unplanned effect upon, or result in a need for new or altered governmental services: police protection? (TRPA 14b)

No. See discussion and analysis for Question 3.16-1 above. No impact.

3.16-4. Will the Project have an unplanned effect upon, or result in a need for new or altered governmental services: schools? (TRPA 14c)

No. See discussion and analysis for Question 3.16-1 above. No impact.

3.16-5. Will the Project have an unplanned effect upon, or result in a need for new or altered governmental services: parks or other recreational facilities? (TRPA 14d)

No. See discussion and analysis for Question 3.16-1 above. No impact.

3.16-6. Will the Project have an unplanned effect upon, or result in a need for new or altered governmental services in maintenance of public facilities, including roads? (TRPA 14e)

No. See discussion and analysis for Question 3.16-1 above. No impact.

3.16-7. Will the Project have an unplanned effect upon, or result in a need for new or altered governmental services in other governmental services? (TRPA 14f)

No. See discussion and analysis for Question 3.16-1 above. No impact.

3.16.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Public service impacts are evaluated in terms of NEPA Intensity Factors 1, 2, and 7.

Issue - Public Services

Direct and Indirect Effects

The proposed action would not result in significant adverse effects to LTBMU law enforcement, wildfire response, or other services. Occasional access limitations to public recreational areas could occur, as discussed under 3.17 Recreation, however, no long-term or permanent access limitation would occur and the public would be able to continue use and enjoyment of public land outside of the control implementation area, staging area, and access. Placement of benthic barriers in the water may include the use of rebar staples if there are no existing rocks in the control site to stabilize the mats. These u-shaped staples lie flat on top of the edges of barrier mat only with the rounded and curved edges of the top of the staple exposed posing no significant hazard to persons recreating in the area. Where active implementation is occurring, staging areas, if needed, would be appropriately fenced and signage placed at access points notifying persons of the activity in the area as described in **MITIGATION MEASURE REC-1**. However, hand removal, diver-assisted suction removal, installation of LFA devices and UVC light control methods would result in little to no access limits or the need for staging or access limits. Forest Plan guideline

SG105 states, “During implementation of projects with the potential to affect recreation activities, implement measures to minimize impacts to recreation opportunities, facilities, and visitor safety. Such measures could include limited use or temporary closures.” Therefore, partial or temporary limits to access are consistent with this direction. No LTBMU facilities would be altered by the proposed action, although the proposed action would improve the public experience on LTBMU lands once treatment has been implemented.

Cumulative Impacts

There are no significant cumulative impacts of the proposed action in relation to public services. Cumulative projects include other AIS control activities, marina maintenance dredging, pier and buoy relocation or improvement, rafting permits, and ferry service on Lake Tahoe, all of which are spread throughout a large area, and most of which would not be within LTBMU-managed areas. Likewise, the implementation of AIP control methods over time would not cause a cumulative impact. Although the proposed action would access LTBMU-managed land to implement some of the control methods, no permanent alteration or significant temporary alteration to LTBMU facilities or operations would cumulatively occur. Access may be somewhat limited during active treatment; however, this would occur over a brief period and treatment would be spread out over a period of years so that access would not be cumulatively impacted with temporary access limitations.

3.16.5 Environmental Commitments and Mitigation Measures

The public services analysis determines that no mitigation measures would be necessary.

3.17 RECREATION

3.17.1 Setting

The Lake Tahoe area is renowned for its beauty as well as its outdoor recreation. Public lands in the Lake Tahoe Basin are used for many different recreation activities year round. Visitation to public parks and recreation areas predominantly occurs during summer and on weekends and holidays. During snow free-months, visitors are able to camp in the campgrounds and picnic, hike, mountain bike, and explore. With shore access, visitors enjoy water sports such as kayaking, canoeing, motor boating, swimming, fishing and scuba diving. During the winter, recreational activities such as sledding, cross-country skiing, and snowshoeing dominate. Some of the control sites are located on or near private recreational providers including boat marinas.

Basin Plan Chapter 5: Water Quality Standards and Control Measures for the Lake Tahoe Basin) has designated beneficial uses for the surface waters of the Lake Tahoe Hydrologic Unit (Lahontan 1995), including beneficial recreational uses Water Contact Recreation (REC-1) and Noncontact Water Recreation (REC-2). REC-1 and REC-2 apply to Lake Tahoe, its tributaries and mashes as they are beneficial uses.

Emerald Bay, marinas, and other public recreational areas along the Lake Tahoe shoreline receive substantial boat traffic, especially between Memorial Day and Labor Day. Lake Tahoe includes visitation from private boats and several commercial boat tour operators who take guests on excursions. In addition to tour operations, many private boaters also frequent the lake for sightseeing, fishing, and camping such as at the Emerald Bay SP Boat Camp, which is a boat-in campground.

The Upper Truckee and Truckee Rivers are also popular recreation areas, with visitors frequently rafting, kayaking or paddling in the area. While no formal operations run on the Upper Truckee River, the Truckee River Raft Company operates a raft service on the Truckee River from Tahoe City to River Ranch.

Various public and private access points and beaches line the shore of Lake Tahoe and the Upper Truckee and Truckee Rivers. Depending on location, these access points and beaches are maintained by various agencies and service providers, including LTBMU, California State Parks, Nevada State Parks, City of South Lake Tahoe, and Tahoe City Public Utility District.

3.17.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct effects to recreation. If AIP spread occurs, impacts may include a diminished recreation experience resulting from loss of lake water visibility, boating obstruction, and nearshore aquatic habitat quality.

3.17.3 Environmental Impacts of the Proposed Action Alternative

Table 3.17-1: Recreation				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.17-1. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? (CEQA XVIa)		X		
3.17-2. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment? (CEQA XVIa)				X
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.17-3. Create additional demand for recreation facilities? (TRPA 19a)				X
3.17-4. Create additional recreation capacity? TRPA 19b)				X
3.17-5. Have the potential to create conflicts between recreation uses, either existing or proposed? (TRPA 19c)				X
3.17-6. Result in a decrease or loss of public access to any lake, waterway, or public lands? (TRPA 19d)		X		

Discussion

3.17-1. Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? (CEQA XVIa)

Less than Significant with Mitigation Measures. The Project does not involve actions that will increase the use of or put at risk existing recreational facilities, such as boating, fishing, and whitewater rafting.

During Project activities, portions of Lake Tahoe, Truckee River, Upper Truckee River, and other popular recreational sites (e.g., marinas, beaches, and state parks) may require temporary boat or rafter traffic control to allow installation and removal of barriers or aeration systems, and ensure the safety of the divers or equipment operators. Boater or recreational water access at any one control site may be limited while the control method is implemented or installed, but those limits would not extend for the entire duration of the peak water recreation season and would on average limit access anywhere from a few hours to a few weeks within a year, depending on the control method and the size of the infestation. Under past AIP control efforts, benthic barriers have posed additional challenges for recreational boating due to an increase in buoys in the waterway, temporary reductions in access, and increased congestion at open ramps. Installation of LFAs could also result in brief access limits as devices are installed. Dredging and associated turbidity curtains may also limit marina access, although dredging would be limited to only those marinas where maintenance dredging has previously occurred and to the extent previously dredged; however, marina maintenance dredging is periodically needed to maintain the function and usability of the marina. Although access would be temporarily limited, in the long-term, dredging control activities also ensure the longer-term usability of the marina. The complete closure of a recreational area for the duration of a recreational season would not occur. UVC light vessels would occupy an area equivalent in size to a boat, but would not otherwise prevent the use of a marina, shoreline, or other waterway.

Within each selected control site, public notices shall be used to inform the public of any temporary boat traffic control or temporary access limitations. With approximately 168,960 acres available for recreation on Lake Tahoe, impacts are considered less than significant considering the proposed annual treatment efforts and maintenance of public access to public recreation areas outside of the immediate treatment area. Additionally, to the extent possible, project activities shall be scheduled in the morning and/or on weekdays. No boat traffic control shall occur on weekends unless it becomes necessary to re-secure a barrier or provide for additional diver safety. Impacts to other recreation facilities are anticipated to be less than significant because the traffic control would be short-term and primarily limited to weekday periods. Additionally, not all control site areas would be treated at the same time, maintaining adequate alternative access in other areas. To ensure public safety, **MITIGATION MEASURE REC-1** shall be implemented to notify the public and maintain public safety when access limitations occur.

3.17-2. Would the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? (CEQA XVIb)

No Impact. The Project does not include recreational facilities or require the construction or expansion of recreational facilities and therefore creates no adverse physical effect on the environment from such facilities.

3.17-3. Will the Project create additional demand for recreation facilities? (TRPA 19a)

No. See discussion and analysis for Question 3.17-1 above. No impact.

3.17-4. Will the Project create additional recreation capacity? (TRPA 19b)

No. The Project does not include recreational facilities or require the construction or expansion of recreational facilities. Dredging would be limited to those marinas in which maintenance dredging has previously been conducted, and would be further limited to the extent of the area previously dredged in the affected marina. Therefore, no expansion of access or capacity would result from dredging AIP control activities. No impact.

3.17-5. Will the Project have the potential to create conflicts between recreation uses, either existing or proposed? (TRPA 19c)

No. Since the Project does not propose recreational facilities or increase demand for recreational facilities, there is no potential for conflict between recreation uses.

3.17-6. Will the Project result in a decrease or loss of public access to any lake, waterway, or public lands? (TRPA 19d)

No, with Mitigation. Temporary limitations on access at specific control sites or portions of control sites may occur. Access limits are not expected to exceed a few days within a year, and only partially limit access to ensure the safety of the equipment operators, installers, or divers. As discussed in Question 3.17-1, public notices would be posted to inform the public of limitations or boat traffic controls under **MITIGATION MEASURE REC-1**. **This impact is considered less than significant with mitigation since** no permanent loss or access limits would occur **at any lake, waterway, or public lands**.

3.17.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Recreation impacts are evaluated in terms of NEPA Intensity Factors 1, 2, 4, 5, 6, and 7.

Issue - Recreational Access Limitations

Direct and Indirect Effects

The direct and indirect impacts of the proposed action include temporary limits on recreational access while active treatment is conducted. Access limitations varies based on the type of treatment conducted. For example, hand pulling, diver assisted suction removal, and UVC light treatment result in no access limits, other than treatment personnel occupying an area for brief periods in the same way that the public may encounter other members of the public in a recreational area.

Installation of aeration systems have the potential to briefly limit access in a specific location in order to maintain safety for both installation personnel and the public. Access at the installation site would be limited to a few hours over the course of a couple of days at most. Once installed, access would be reopened. Since aeration systems would be used in an enclosed area, materials could be briefly stored onsite during the installation process. No access limits would be imposed during use of an aeration system, except for periodic maintenance.

Likewise, installation of benthic barriers may limit access for a few hours over the course of a few days. Access to the active installation area would be limited to ensure the safety of both visitors and the installation personnel. Since benthic barriers utilize large mats, small portions of parking areas may be used for staging. Staging areas would be fenced with signage placed on the fencing, as well as at access points, notifying the public of the activity occurring and the access limit period as described in resource protection measure **MITIGATION MEASURE REC-1**. Because benthic barriers may be suitable within heavily infested tributary areas, trails may be used to access the control site. While trails would not be fully closed, access along the trail at those locations may be reduced. Use of benthic barriers also includes the use of rebar u-shape staples where existing rocks are not available to secure the mats or in areas of heavy motorize boat use. These staples are curved and lie flush to the mat, creating little recreational obstacle. Gravel bags may also be used, although sparingly as they are considered to be additional "fill material." Securing the benthic barriers would not cause a significant hazard risk for recreational users of an area.

Finally, dredging would be limited to marinas in which dredging has been previously conducted. While dredging is occurring, access to and use of the marina would be limited to ensure the safety of the public and machinery operators. It is not expected that treatment implementation would cause an increase in recreational use or significantly increase user demand at recreational areas not undergoing active treatment. As stated in Forest Plan guideline SG105, limited use or temporary closures are acceptable actions to minimize impacts to recreation opportunities, facilities, and visitor safety. Implementation of resource protection measure **MITIGATION MEASURE REC-1** ensures that appropriate agency coordination and public notification occurs, and recreational safety is maintained during the treatment process. It should be noted that removal of aquatic invasive species would improve the recreational experience, resulting in a beneficial impact.

Cumulative Impacts

Cumulatively, the proposed action would contribute to temporary access limitations; however, due to the brief nature of the access limits, the staggered implementation of the control methods, the large range of alternative access points in the area, and the beneficial impact of maintaining the natural habitat and removing invasive aquatic species that threaten native vegetation and water clarity, no significant cumulative impact would occur.

3.17.5 Environmental Commitments and Mitigation Measures

The recreation analysis determines that **MITAGATION MEASURE REC-1** is necessary to reduce potential impacts to public access safety to a level of less than significant.

Mitigation Measure REC-1: Public Notice, and Staging Safety

- Where control methods are implemented in public recreation areas, the entity with jurisdiction over the recreation area to be treated shall be notified by Tahoe RCD **and/or other project proponents implementing AIP control**. On National Forest Service lands, **the implementing project proponent and/or** Tahoe RCD shall coordinate with the Forest Service permittee at the site where the control method is to be implemented. Coordination and scheduling shall occur in advance of the control activity to ensure there are no scheduling conflicts with planned events and to ensure appropriate onsite public safety actions are implemented. This includes coordination with the US Coast Guard during dredging operations. Permit requirements related to access and safety shall be implemented.
- Where public access is limited during control activities, including in waterways, marinas, parking lots, and trails used to access control sites, signage shall be posted indicating what access limitations are occurring, the duration of the event, and a contact and phone number should the public have questions or need to report an incident.
- In staging areas, signage and safety barriers shall be erected around materials and equipment to prevent public access and maintain safety.
- To the extent feasible, AIP control activities that temporarily reduce public recreation access, shall be scheduled for early morning and weekday periods to avoid heavier recreational activity hours.

3.18 TRANSPORTATION, TRAFFIC, AND CIRCULATION

3.18.1 Setting

The predominant mode of transportation used in the Lake Tahoe Basin remains the private motorized vehicle (TRPA 2017). In the summer, there is considerable private vehicle traffic on the highways around the lake and at times traffic can become congested on these roads.

Streets and Highways. State Routes 28 and 89 and U.S. Highway 50 encompass the perimeter of Lake Tahoe. These main travel corridors can experience high traffic volume from private vehicles during portions of the year, specifically summer between Memorial Day and Labor Day holidays.

Road Traffic and Level of Service. Level of Service (LOS) measures how the route operates during peak hour traffic. LOS summarizes the effects of speed, travel time, traffic interruptions, freedom to maneuver and other factors. The performance of the state and local roads and highways is evaluated based on LOS definitions. Six levels of service represent varying roadway conditions ranging from ideal (LOS "A") to forced flow (LOS "F"). According to the TRPA Regional Transportation Plan IS/MND 2017, no major intersections currently operate at LOS F; however some operate at LOS D or E at peak periods, including SR 28/SR 267, US 50/Park Avenue, US 50 from Pioneer Trail to Arapahoe Street, US 50 from Tahoe Keys Blvd. to Winnemucca Ave., US 50 from Edgewood Circle to Al Tahoe Blvd, US 50 from Pioneer Trail to Park Avenue, SR 28 from Red Cedar Dr to W. Lakeshore Blvd, and from Cal Neva Drive to Stateline Rd, and SR 89 west of Fairway Drive, among others.

Vehicle Miles Traveled. Vehicle Miles Traveled (VMT) measures the distance a vehicle or vehicles travel, within a specific area or over a specific time period. VMT is categorized into home to work trips, home to other places trips, and other places to other places trips. Different land uses generate different amounts of VMT depending on the size and location of the use, which can affect the number or types of trips generated. Trips generated by residents, visitors, and business operations are counted, and the presence and proximity of transit or non-motorized transportation facilities are considered.

Bicycle Traffic. The Lake Tahoe Regional Bicycle and Pedestrian Master Plan was developed in 2003 by the Tahoe Metropolitan Planning Organization, updated in 2010, and integrated into the 2017 Regional Transportation Plan. This plan provides a “blueprint for developing a regional bicycle and pedestrian system that includes both on-street and off-street facilities as well as support facilities and programs throughout the Lake Tahoe region”.

Parking. During peak visitation in the summer, parking on paved surfaces is limited to a first-come, first served basis at the State Parks, NTPUD, City of South Lake Tahoe and LTBMU recreational sites and lake and river access areas. There are no parking facilities in the active Project Area; however, access and staging areas may be located in existing parking facilities when appropriate.

Lake Tahoe. Lake Tahoe serves waterborne traffic, including private watercraft and boating vessels, water taxis, and excursion lines. Numerous public and private docks and piers, marinas, and boat launch facilities are located within the lake. Since the lake is located in both California and Nevada, the US Coast Guard monitors the waters and enforces water traffic safety, along with other state and local agencies, particularly the TRPA.

3.18.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct or indirect effects transportation or traffic.

3.18.3 Environmental Impacts of the Proposed Project Alternative

Table 3.18-1: Transportation, Traffic and Circulation				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.18-1. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities? (CEQA XVIIa)				X
3.18-2. Conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? (CEQA XVIIb)			X	
3.18-3. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? (CEQA XVIIc)		X		
3.18-4. Result in inadequate emergency access? (CEQA XVIId)			X	
TRPA Initial Environmental Checklist Item	**Yes,**	**No, With Mitigation**	**Data Insufficient**	**No**
3.18-5. Generation of 100 or more new Daily Vehicle Trip Ends (DVTE)? (TRPA 13a)				X
3.18-6. Changes to existing parking facilities, or demand for new parking? (TRPA 13b)				X
3.18-7. Substantial impact upon existing transportation systems, including highway, transit, bicycle or pedestrian facilities? (TRPA 13c)				X
3.18-8. Alterations to present patterns of circulation or movement of people and/or goods? (TRPA 13d)				X
3.18-9. Alterations to waterborne, rail or air traffic? (TRPA 13e)		X		
3.18-10. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians? (TRPA 13f)				X

Discussion

3.18-1. Would the Project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities? (CEQA XVIIa)

No Impact. The Project is a resource management project and would not cause a substantial increase in traffic volume, result in additional congestion, or conflict with any local plan or ordinance. No impact.

3.18-2. Would the Project conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? (CEQA XVIIb)

Less than Significant Impact. The Project implements different types of aquatic invasive plant control methods at various locations in and around the lake and its tributaries. It does not result in the permanent development of a new use or facilities and would not generate regular traffic on a daily, monthly, or annual basis. While some VMT occurs in implementing the control methods, these trips would be sporadic, based on the type of treatment used, and the duration of the treatment as a result of the size of the treatment area and methods used. For example, hand pulling or monitoring may involve one or two individuals visiting a site or series of sites in a day, a few per year, whereas dredging requires operator trips as well as equipment transport trips to and from each dredging site, which may require more trips due to transporting the equipment used. Equipment would not be moved to and from sites on a daily basis, but such equipment may need to travel a farther distance than a local diver. Since these resource management activities are temporary, they are not significant contributors to VMT and would not exceed VMT thresholds.

3.18-3. Would the Project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? (CEQA XVIIc)

Less than Significant with Mitigation Measures. The Project requires no change to the current design or uses of existing roadways and arterials.

The Project does include activities that occur within navigable waterways, although no new permanent structures that would affect navigation are proposed. LFA systems involve the placement of diffusers or air lines at the bottom of the lakebed with no disturbance to the substrate. The bottom benthic barriers would be secured to the lake substrate. Barrier movement or billowing could present an obstacle for boat traffic, although there has been no indication of these occurrences during previous treatment operations. Removal efforts would involve personnel removing the stakes and rolling up barrier mats. Dredging activities may limit access and use of the affected marina for a brief period, but such activity would employ the safety standards and notification requirements that have been used in the affected marinas in the past to perform regular marina maintenance dredging activities. A Section 10 permit from the USACE and coordination with the US Coast Guard is required for maintenance dredging to ensure water traffic and navigational safety per 33 CFR 325.6(e). Implementation of **MITIGATION MEASURE TRANS-1** would ensure this potential impact is less than significant.

3.18-4. Would the Project result in inadequate emergency access? (CEQA XVIId)

Less than Significant Impact. Boat traffic in and out of the mouth of Emerald Bay and in marina or boat launch areas may need to be temporarily restricted during installation and removal of bottom barriers and LFA systems to protect the safety of the divers and allow the divers to conduct treatment activities with no overhead boat wake. Work would be coordinated with the U. S. Coast Guard for diver protection and safety. While boat traffic could be temporarily controlled at control sites, Project activities could be halted in the case of an emergency to allow boat traffic, in coordination with the U. S. Coast Guard, resulting in less than significant impacts.

3.18-5. Will the Project result in generation of 100 or more new Daily Vehicle Trip Ends (DVTE)? (TRPA 13a)

No. The Project would not generate 100 or more DVTE. While the number of personnel implementing the treatment will vary based on the type of treatment and are to be treated, this temporary Project would not generate over 100 DVTE. Methods such as hand pulling, monitoring, diver-assisted suction removal and UV light treatment would be less intense in terms of equipment and material hauling trips than dredging, benthic barriers, or aeration systems; however each method would generally require no more than two to four persons and equipment and material hauling would not occur daily through the treatment period. Even with multiple areas treated concurrently, the combined DVTE would not approach or exceed 100. Once installed, methods such as benthic barriers and aeration systems would not generate trips until the systems are removed or unless maintenance or monitoring occurs. Likewise, post-treatment monitoring would generate less than one trip per day, resulting in no significant impact.

3.18-6. Will the Project result in changes to existing parking facilities, or demand for new parking? (TRPA 13b)

No. The Project does not propose to develop new parking facilities or permanently alter existing facilities, and would not generate a demand for parking of a magnitude that would constrain existing parking facilities or require the construction of new facilities. Existing parking spaces would be occupied by personnel implementing the treatment, such as divers, machine operators, and biological monitors; however, only a few personnel would occupy an area at a time, as discussed in Question 3.18-5. Methods that require installation of materials, such as benthic barriers or aeration systems, may temporarily utilize existing parking areas for staging of equipment and materials; however, the use of parking areas for staging would only occur over a period of a few days. With implementation scheduled to avoid popular weekend periods, the impact on parking would not be significant. Methods such as hand pulling or diver assisted suction require little to no material or equipment storage within parking lots as removed plant materials are immediately discarded and diving or suction equipment is not left onsite. Boats and barges used for UV light treatment or dredging may occupy a parking space once removed from the water; however, as treatment is expected to avoid busy weekend periods, the temporary utilization of a small number of parking spaces would not create a significant impact.

3.18-7. Will the Project result in substantial impact upon existing transportation systems, including highway, transit, bicycle or pedestrian facilities? (TRPA 13c)

No. The Project does not propose to alter existing transportation systems, significantly increase demand on transportation systems, or result in the need for repair or replacement of such systems. Highways may be utilized for the transport or personnel and materials, including dredging equipment and boats, however, no significant number of trips would occur that would impact the existing transportation system. Transit systems would not be impacted. Where there are bicycle or pedestrian facilities near marshes, tributaries, or even the lake shoreline, personnel may access specific control sites through existing trails for less intense treatment (monitoring and hand pulling); however this would not prevent use of the trail by others or increase use of the trail such that the trail became impacted and trail function decreased. No roads or trails would be closed as a result of Project implementation.

3.18-8. Will the Project result in alterations to present patterns of circulation or movement of people and/or goods? (TRPA 13d)

No. The Project would not alter current circulation patterns or movement of people or goods. No alteration to circulation systems is proposed and the movement of personnel, equipment, and materials by the Project would not cause an alteration to current patterns of circulation.

3.18-9. Will the Project result in alterations to waterborne, rail or air traffic? (TRPA 13e)

No, with Mitigation. Rail and air traffic would not be affected by the Project. Waterborne traffic may experience some degree of change or limitation during implementation of control methods to protect both divers working in the area and boaters. As discussed in Question 3.18-3, project activities may occur within navigable waterways. Boat traffic would be required to safely navigate around divers, barges, or other floating devices located outside marina areas. Activities within marina areas such as dredging or installation or removal of benthic barriers and aeration systems may temporarily limit or prevent access. If benthic barriers or aeration systems come loose, they can present an obstacle for boat traffic, although there has been no indication through previous treatment operations that such an action would occur. **MITIGATION MEASURE TRANS-1** addresses navigational hazards by requiring routine inspection of underwater control equipment and maintenance, if needed, as well as scheduling control implementation to avoid high traffic periods. Under **MITIGATION MEASURE REC-1**, permits and coordination with the US Coast Guard may be required for some types of treatment, such as dredging, and the terms of the permits shall be implemented to ensure navigational safety is maintained. Some low-intensity control methods may be used within the Upper Truckee River system near the Lake Tahoe Airport. While treatment activity would not prevent the use of the airport, notification of and coordination with the airport should occur to ensure site safety, as is prescribed in **MITIGATION MEASURE HAZMAT-2**. Implementation of **MITIGATION MEASURES TRANS-1, HAZMAT-2,** and **REC-1** would ensure this potential impact is less than significant.

3.18-10. Will the Project result in increase in traffic hazards to motor vehicles, bicyclists, or pedestrians? (TRPA 13f)

<u>No.</u> Treatment operations and staging would not occur on area roadways, bike lanes, or trails. While movement of personnel and equipment may utilize roadways and for less intense operations, trails, to access the control sites, no treatment activity would occur on roads or trails. Equipment located on the shoreline or in parking areas would be clearly marked and barriers installed to maintain public safety.

3.18.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Transportation impacts are evaluated in terms of NEPA Intensity Factors 1, 2, and 7.

Issue - Access Disruption or Limitation

Direct and Indirect Effects

The Proposed Action may limit full access to some areas while active treatment or installation of treatment equipment occurs. In the case of hand pulling or diver assisted suction, public use of the area may still occur, but would be required to avoid the specific areas where work is actively engaged. Likewise, the use of a UVC-light treatment boat, may temporarily occupy an area on the water, but would not prevent others from accessing or using the area. Trails and roads would not be closed as a result of project implementation and no new permanent or temporary roads are proposed. While portions of some parking areas may be used for staging, large sections of parking lots would not be closed and the staging areas utilized for brief periods, not resulting in any permanent or long-term closures. **MITIGATION MEASURE REC-1** ensures appropriate notification signage, safety barriers, and implementation of permit terms are implemented to maintain navigational, bike, and pedestrian safety.

Cumulative Impacts

There are no cumulative impacts of the proposed action. Since the project would be implemented over a number of years and in a variety of locations, the impact to LTBMU lands would be brief and would not contribute to a cumulatively considerable impact. No full access closures are proposed and the short duration of parking lot staging area use would be insignificant.

3.18.5 Environmental Commitments and Mitigation Measures

The transportation and traffic analysis determines that **MITIGATION MEASURES TRANS-1**, **HAZMAT-2**, and **REC-1** would be necessary to avoid potential impacts to boat and raft traffic on Lake Tahoe, the Upper Truckee River, and the Truckee River.

Mitigation Measure TRANS-1: Communication Coordination and Securing Barriers and Aeration Systems

1. Bottom barriers and aeration systems shall be checked routinely to inspect and re-secure any treatment materials that move or start to billow or become unsecure. **During project planning, scheduled maintenance visitation of barriers and aerations systems will be determined based on site specific characteristics (e.g., inspected at least monthly or more frequently based on site specific characteristics that affect equipment stability such as water depth, wave action, wind exposure, and amount of recreational access).**
2. Prior to work within affected marinas, Tahoe RCD shall coordinate with the marina to secure access, coordinate and schedule activity that would be occurring in the area, and implement appropriate safety protocol required by the marina.

3.19 TRIBAL CULTURAL RESOURCES

3.19.1 Setting

Tribal cultural resources are sites, features, places, cultural landscapes, sacred places and objects with cultural value to California Native American tribes that are included in or eligible for inclusion in the California Register of Historical Resources. These resources may also be included in a local register of historical resources or they may include a resource that the lead agency determines to be significant with substantial supporting evidence. Cultural landscapes meet these criteria in that the landscape can be geographically defined in terms of the size and scope of the landscape. Tribal cultural resources can also include historical resources and unique and non-unique archaeological resources that meet these criteria. Washoe Tribe of Nevada and California occupation of the Lake Tahoe Basin has been demonstrated to extend back at least 1,500 years (LTBMU 2016).

Tribal cultural resources are regulated through CEQA by Assembly Bill 52 (AB 52), which incorporated tribal cultural resources, effective January 1, 2015, into CEQA Guidelines Appendix G. AB 52 establishes a consultation process with all California Native American Tribes on the Native American Heritage Commission List, requiring the lead agency to provide formal notification to the designated contact or tribal representative of the California Native American Tribe that is associated with the geographic area of the project and have requested in writing to be informed by the lead agency of CEQA applicable projects. Once the lead agency has provided formal notification, the tribe or their representative must respond in writing within 30 days of receipt of the notification. If response is provided, the lead agency must begin consultation with the responding tribe. If no response is provided by the notified tribe(s) within the 30 day timeframe, no further action is required, and the lead agency may certify or adopt the CEQA document. Likewise, AB 52 does not require notification be provided to tribes who have not requested notification of CEQA actions from the lead agency.

Consultation includes discussion of the type of environmental review to be conducted, the significance of tribal cultural resources, impact significance on tribal cultural resources, alternatives, preservation methods, and mitigation measures. Consultation concludes when the lead agency and tribe agree to mitigation measures or avoidance or when a party who has acted in good faith and with reasonable effort, concludes that mutual agreement can’t be reached.

Data regarding cultural tribal resources shall not be included the CEQA document or otherwise disclosed to the public without prior consent from the affected California Native American tribe. Information shall be kept in a confidential appendix to the environmental document unless the tribe consents in writing to the disclosure. Publicly available data, data already possessed by the applicant prior to consultation or generated independently by the applicant, or that are lawfully obtained by the applicant from a third party that is not the tribe, lead agency, or another public agency are not subject to the confidentiality regulations.

Federal and state regulations, the TRPA Code (Chapter 67) and local General Plan policies address the protection of cultural resources and provide processes to avoid or minimize impacts to such resources. An impact to tribal cultural resources is considered significant if substantial adverse change to the significance of the resource occurs.

The Project falls under a complex regulatory setting, with a nexus of federal state and regional permitting agencies, as described in more detail in Section 3.6, Cultural, Archeological, and Historical Resources. As such, Native American consultation is integral to meeting the intent of cultural resources laws, specifically National Historic Preservation Act (NHPA) and CEQA, as well as collecting important information on any Tribal Resources within the Project Area of Potential Effects (APE). As the lead federal land and permitting agency, the LTBMU will conduct Tribal Consultation under the NHPA in support of a NEPA decision and the USACE will conduct Tribal Consultation under the NHPA in order to update the existing CWA Section 404 authorization for the Project. Consultation under AB 52 has been completed. The Washoe Tribe of Nevada and California are the sole tribe listed on the AB52 consultation list. The Sacred Lands Search yielded three contacts: two from the Colfax-Todds Valley Consolidated Tribe (Miwok/Maidu) and the Washoe.

3.19.2 Environmental Impacts of the No Action Alternative

The No Action alternative would have no effect on tribal cultural resources because there would be no measurable change in the condition of the natural environment upon which these values depend, and the Project Area is not identified as a Native American religious or sacred site.

3.19.3 Environmental Impacts of the Proposed Action Alternative

Table 3.19-1: Tribal Cultural Resources

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
Has a California Native American Tribe requested consultation in accordance with Public Resources Code section 21080.3.1(b)? Yes: __X___ No:_______				
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
3.19-1. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)? (CEQA XVIIa)		X		

TRPA Initial Environmental Checklist Item	Yes	No, With Mitigation	Data Insufficient	No
3.19-2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. (CEQA XVIIb)		X		
3.19-3. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values? (TRPA 20d)		X		
3.19-4. Will the proposal restrict historic or pre-historic religious or sacred uses within the potential impact area? (TRPA 20e)		X		

Discussion

3.19-1. Would the Project cause a substantial adverse change in the significance of a tribal cultural resource listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)? (CEQA XVIIIa)?

Less than Significant with Mitigation Measures. In order to accomplish the intent of consultation under CEQA, and specifically AB52, Cardno conducted a Sacred Lands Search and requested the AB52 consultation list from the NAHC on behalf of Tahoe RCD, as the lead CEQA agency. Consultation under AB52 is ongoing. The Washoe Tribe of Nevada and California (Washoe) are the sole tribe listed on the AB52 consultation list.

The Sacred Lands Search was conducted with the NAHC Commission, NVCRIS, and NCIC and results were received on May 24, 2019. The Sacred Lands Search yielded three contacts: two from the Colfax-Todds Valley Consolidated Tribe (Miwok/Maidu) and the Washoe. The AB 52 consultation list was received on November 7, 2019, and a consultation letter was sent to the Washoe Tribe on November 11, 2019. This was followed by a phone call on December 11, 2019 to confirm receipt and determine if Mr. Cruz, Tribal Historic Preservation Officer had any concerns, comments, or input on the Project.

Mr. Cruz requested that the Project continue to inform and consult with the Washoe and avoid effects to cultural resources, especially during dredging activities. He recommended a monitor to screen or evaluate the dredged materials through visual inspection as materials are collected. He requested that he be sent the final report, a check of the contractor's compliance be made and that an inadvertent discovery plan be developed. Mr. Cruz also commented that any map of archaeological sensitivity should be considered confidential and that the Tribe considers all pre-historic resources as high sensitivity and they should be treated accordingly. Lastly, he stated that the Tribe is in favor of using buffer zones for protection of cultural resources during Project activities. Continued consultation and communication with the Washoe of Nevada and California, and other California and Nevada Tribes will be conducted by the lead federal agencies; USACE and LTBMU as part of their Section 106 process.

In addition, as the Project progresses updates will be provided to participating Native American Tribes. The timeline for response established in AB 52 (30 days) has been exceeded, and no further consultation action is required, but the Washoe Tribe of Nevada and California will be noticed as to the release of the Public Draft IS/IEC/EA and provided the additional opportunity to comment during the public comment period.

As part of this sensitivity analysis, Cardno examined the various AIP control methods and developed a sensitivity analysis based on the results of the records search results. These were categorized into exempt and screened activities, and ground disturbing activities.

Based on the AIP control methods categorization and location and density of cultural resources identified through the record searches, a cultural sensitivity range of Low, Moderate, High and Unknown and corresponding map was developed, as described in the Cultural Resources Report and illustrated in Figure 3.6-2 of the Cultural Resources section. Important to note is that the 2014 cultural resource assessment also produced a sensitivity map, but associated mapping did not include the expanded APE or record search results from the California and Nevada Information Centers.

AIP control actions will avoid known Tribal cultural resources located within the Project APE. Through implementation of **MITIGATION MEASURE TRIBAL-1**, potential project-level impacts to Tribal cultural resources will be avoided and reduced to a level of less than significant.

3.19-2. Would the Project cause a substantial adverse change in the significance of a tribal cultural resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? *In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.* (CEQA XVIIIb)

<u>Less than Significant with Mitigation Measures</u>. See discussion and analysis for Question 3.19-1 above.

3.19-3. Does the Project have the potential to cause a physical change which would affect unique ethnic cultural values? (TRPA 20d)

<u>No, with Mitigation</u>. See discussion and analysis for Question 3.19-1 above.

3.19-4. Will the Project restrict historic or pre-historic religious or sacred uses within the potential impact area? (TRPA 20e)

<u>No, with Mitigation</u>. See discussions and analyses for Questions 3.19-1 above.

3.19.4 NEPA Analysis of Effects

The USACE has permitting authority over the Project actions under CWA Section 404 and is responsible for Section 106 compliance with the NHPA as a federal permitting agency. The NHPA requires federal agencies to take into account effects of projects on historic properties caused by federal actions, and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings through consultation with the State Historic Preservation Officer (SHPO).

The LTBMU has jurisdiction of federally designated forest areas of the United States within the Lake Tahoe Basin, as described in the Land Management Plan (LTBMU 2016) The Project falls under LTBMU jurisdiction as a federal land management agency. Approval of the Project requires preparation of an Environmental Assessment (EA), and the Project must also comply with the standards and guidelines of the Land Management Plan, commonly referred to as the Forest Plan. Forest Service Manual 2360 outlines laws, Executive Orders, regulations, and Federal guidelines governing Forest Service Heritage Program Management. A program of research, protection, rehabilitation, and interpretation of cultural resources which are determined eligible for National Register of

Historic Places or whose eligibility are undetermined is ongoing and effective. Known cultural resources are proactively managed to enhance their scientific, cultural, historical, and traditional values. LTBMU's cultural resources program is focused on three main areas of resource management: 1) providing education, interpretation, and research opportunities; 2) protecting archeological, historical, cultural and traditional resources; and 3) collaborative partnering with the Washoe Tribe and other heritage-resource interests. (LTBMU 2016). Additionally, there are approximately 24 acres of former NFS lands within the Lake Tahoe Basin held in trust for the Washoe Tribe by the U.S. Department of the Interior. The Washoe Tribe of Nevada and California is the tribal government that works with the LTBMU on a government-to-government basis. The Tribal Relations Program Strategy includes directives for consultation with Indian Tribal Governments (Executive Order 13084) and consultation with Indian Tribal Governments (Executive Order 13175).

Other Sources of Information for Tribal relations listed in the Forest Plan include:

- American Indian Religious Freedom Act of 1978 as amended (42 USC 1996 and 1996a)
- EO 13084-Consultation with Indian Tribal Governments
- EO 13175-Consultation with Indian Tribal Governments
- Cooperative Agreement, February 26,1999, establishing collaborative wetlands conservation planning for the Baldwin/Taylor Creek and Meeks Meadow areas
- Record of Decision for Cave Rock Management Direction Final Environmental Impact Statement, USDA Forest Service, Lake Tahoe Basin Management Unit, August 5, 2003, Cave Rock Closure Forest Order No. 19-08-01.
- Native American Graves Protection and Repatriation Act (NAGPRA).
- 36 CFR 223 Subpart G – Special Forest Products.
- 36 CFR 223 Subpart H – Forest Botanical Products.

Tribal cultural resource impacts are evaluated in terms of NEPA Intensity Factors 1, 3, 5, 6, 7, 8, and 10.

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description.

Issue - Effects to Washoe Tribe of Nevada and California Heritage Resources

Direct and Indirect Effects

The Washoe Tribe of Nevada and California was contacted regarding this project as discussed above under Question 3.19-1 in compliance with Forest Plan guideline SG123. Tribal cultural resources would be affected if AIP control activities will have an adverse effect to the integrity of the treatment area. Hand pulling, benthic barriers, UV-C light treatment, and LFA are actions that may be screened by a qualified Cultural Resource Specialist (CRS) who meets the Secretary of Interior Standards in Archaeology and can make the determination that no further protection is recommended due to the low potential of these actions to adversely affect or impact cultural resources. Direct and indirect effects may result from AIP control methods that necessitate bed substrate disturbance, which include hand suction removal and hydraulic suction and mechanical dredging.

Due to the temporary nature and location of Project activities, significant impacts to historical or archaeological resources are not anticipated and no human remains would be exhumed. Known resources will be flagged, avoided and protected. However, because some Project activities would disturb the lake or river bottom, the potential exists to uncover previously unidentified cultural resources. AIP control actions will avoid known Tribal cultural resources located within the Project APE. Through implementation of **MITIGATION MEASURE TRIBAL-1**, potential project-level adverse effects to Tribal cultural resources will be avoided.

Cumulative Impacts

There will be "no adverse effect" from AIP control actions to Tribal cultural resources. Tribal Cultural resources within the Project APE will be protected and avoided. Because potential project-level effects would not result, direct and indirect effects would not combine to result in adverse cumulative impacts.

3.19.5 Environmental Commitments and Mitigation Measures

The tribal cultural resources analysis determines that **MITAGATION MEASURE TRIBAL-1** is necessary to avoid and reduce potential impacts to resources to a level of less than significant.

Mitigation Measure TRIBAL-1: Tribal Cultural Resources Consultation

Prior to beginning AIP control methods that necessitate ground (i.e., bed substrate) disturbing activities within a culturally sensitive area, **<u>the project pronponent and/or</u>** Tahoe RCD shall consult with the Washoe Tribe of Nevada and California Tribal Historic Preservation Officer and the USACE Cultural Resources Specialist or Forest Service Heritage Program Director, as dictated by control site location, to review recorded submerged resources and specific flagging distances necessary for avoidance and protection of Tribal cultural resources and Washoe heritage sites. If tribal cultural resources are discovered within the treatment area, **<u>the project proponent and/or</u>** Tahoe RCD will further consult with the Washoe Tribe of Nevada and California to protect and further avoid those resources.

3.20 UTILITIES, SERVICE SYSTEMS AND ENERGY

3.20.1 Setting

The Project would be conducted within the boundaries of Lake Tahoe, tributaries and marshes along Lake Tahoe, the Upper Truckee River, and the Truckee River. Utilities and services are available at day use and campground facilities and at times at lake and river access points and parking areas. Day use areas, some of which are operated by utility districts, provide picnic tables, barbecues, bathroom sinks, flush toilets, and garbage disposal. Campgrounds offer picnic tables, barbecues, campfire pits, water spigots, bathroom sinks, flush toilets, showers, garbage disposal, and lighted areas at night. The residences and businesses in the vicinity of the control sites are served by utility and service systems, and utility infrastructure, including water intake lines, are near or sometimes within, potential treatment areas. Multiple service providers and utility companies operate in the Project Area.

<u>Water.</u> Surface water suppliers include Cave Rock Water System, Edgewood Water Company, Glenbrook Water Company, Incline Village GID, Kingsbury GID, North Tahoe PUD, Round Hill GID, Skyland Water Company, Tahoe City PUD, Zephyr Water Utility, and Lakeside Park Association, Groundwater is supplied by South Tahoe PUD, Lukins Brothers Water, and Tahoe Keys Water Company. Additionally, a number of small public and private water companies provide water service within their boundaries.

The Basin Plan (Lahontan 1994, as amended) designates beneficial uses for the surface waters of the Lake Tahoe Hydrologic Unit, including Municipal and Domestic Supply (MUN). There are numerous water intakes within the general Project Area and the potential for water intakes to be in the proximity of control sites. Intake lines are operated by Kingsbury General Irrigation District (GID), Round Hill GID, Zephyr Water Utility Company, Skyland/Cave Rock, Incline Village GID, Glenbrook Water Company, Edgewood Water Company, North Tahoe Public Utility District (PUD), Tahoe City PUD, and Lakeside Park Association. Most of the intake lines are located in Southeast Lake Tahoe. TRPA Code Section 60.3 addresses source water protection zones and establishes a 600 foot radius around wells, lake intakes, and springs. There are various source water protection zones established around the lake.

Wastewater. Sewage collection and treatment is provided by a number of service districts. In Nevada, service is provided by Incline Village General Improvement District and Douglas County Sewer Improvement District #1, which receives wastewater collected by Round Hill GID and Kingsbury GID. In California, North Tahoe PUD and Tahoe City PUD collect wastewater generated within the Placer County area of the Lake Tahoe Region and the Truckee Tahoe Sanitation Agency treats the collected wastewater at the Truckee Water Reclamation Plant. Within the El Dorado County area, South Tahoe PUD collects, treats, and exports the wastewater to Alpine County.

Storm Water Drainage. Each jurisdiction, such as counties and cities, in the project area operate storm water drainage facilities. Storm water collection and release locations may be present near the treatment areas; however, they are primarily located within heavily urbanized areas of the Lake Tahoe Region where there is substantial impermeable ground coverage, such as roads and parking lots, that cause surface runoff. Since the Project area consists of area waterways (Lake Tahoe, marshes, and associated tributaries) there is little storm water infrastructure within the project footprint.

Solid Waste. Garbage collected in the day use and campground facilities is removed by land management personnel and deposited into commercial contract containers. Refuse containers are picked up by contracted disposal service providers. General residential and commercial solid waste is contracted by refuse services per each jurisdictional area or business. Solid waste service providers include South Tahoe Refuse Company, Tahoe Truckee Sierra Disposal, and Waste Management Incline Village. Solid waste is transported to Lockwood Regional Landfill in Storey County, NV, which receives approximately 4,000 tons per day and has a lifespan of approximately 150 years.

Electricity and Natural Gas. Electricity is provided to the area by NV Energy in Nevada and Liberty Utilities in California. Both above ground, pole-mounted electrical lines and buried electrical lines are provided throughout the area and may be present in or near the control sites. Natural gas is provided by Southwest Gas, and distribution lines are located underground throughout the developed areas.

Telecommunications. Telecommunication services are provided by a number of companies including AT&T, Frontier, and Charter Spectrum. These companies provide television, internet, and telephone connection services throughout the area through both above and below-ground infrastructure.

Other Service Systems. The Project may involve activities that would temporarily disturb the lake bottom or tributary substrate, primarily while driving short rebar stakes into the bottom substrate to secure barriers. Documentation of subsurface utilities under the control sites will occur as required for CWA 401 Certification as described in Section 2.3.3.8.

3.20.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct or indirect effects to most utilities. AIP, however, have the potential to directly impact water intakes in Lake Tahoe.

3.20.3 Environmental Impacts of the Proposed Project Alternative

Table 3.20-1: Utilities, Service Systems and Energy				
CEQA Environmental Checklist Item	**Potentially Significant Impact**	**Less Than Significant with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
3.20-1. Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects? (CEQA XIXa)		X		
3.20-2. Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years? (CEQA XIXb)				X
3.20-3. Result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments? (CEQA XIXc)		X		
3.20-4. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? (CEQA XIXd)			X	
3.20-5. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? (CEQA XIXe)				X
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
Except for planned improvements, will the proposal result in a need for new systems, or substantial alterations to the following utilities:				
3.20-6. Power or natural gas? (TRPA 16a)				X

3.20-7. Communication systems? (TRPA 16b)				X
3.20-8. Utilize additional water which amount will exceed the maximum permitted capacity of the service provider? (TRPA 16c)				X
3.20-9. Utilize additional sewage treatment capacity which amount will exceed the maximum permitted capacity of the sewage treatment provider? (TRPA 16d)				X
3.20-10. Storm water drainage? (TRPA 16e)				X
3.20-11. Solid waste and disposal? (TRPA 16f)				X

Discussion

3.20-1. Would the Project require or result in the relocation or construction of new or expanded water, wastewater treatment for stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? (CEQA XIXa)

Less than Significant with Mitigation Measures. The Project does not propose a sanitary sewer or connections to an existing municipal wastewater treatment plant. No new water treatment, wastewater treatment, or stormwater drainage facilities or expansion of these facilities would be required as a result of this Project. There would be no requirement for the wastewater treatment provider to make a determination of capacity to service the Project because of the minor service needs and because the action would occur under the existing decontamination program for the Lake Tahoe Basin. The Project will not create a demand for new water or sewer infrastructure and will not require the construction of new water or sewer or the expansion of existing facilities. No new or expanded entitlements are necessary. The Project will not create a demand for new sewer infrastructure and will not require the construction of new sewer or the expansion of existing facilities. The Project does not require connection to telecommunications facilities, natural gas or electric power as equipment would be fueled by battery and gas, with the exception of an air compressor used to operate the LFAs. In areas where LFA is used, typically marinas where there is some degree of enclosure, the aeration system would need to be powered by an air compressor. The air compressor would need to connect to an electricity source. Since aeration would be limited to enclosed marina areas, the compressor would connect to the existing electrical system at the marina and would require low levels of electricity to operate. The demand on the electrical system would be less than the demand generated by a residence, and no new improvements or connections would be required. Electric vehicles used for transport would not require the relocation or construction of electric power systems. The Project results in no impact to existing provider commitments or projected capacity demands. No new or relocated infrastructure is proposed or needed.

Although the Project would not consume potable water or increase demand for demand, there are water intake lines within the vicinity of some control sites in Lake Tahoe that have the potential to be affected by treatment activities that can temporarily increase water turbidity. For example, benthic barriers can accumulate sediment after sitting in place for many weeks or months. Removing the benthic barriers can release those sediments into the water column and temporarily increase the turbidity of the water in the vicinity of the activity. Intake lines nearby may experience an increase in turbidity levels from waters drawn from the affected area. Therefore, it is recommended that water intake lines within 25 feet of control sites are turned off during removal of the benthic barriers or dredging activity and shall not be turned back on until water quality returns to background levels, as discussed in **MITIGATION MEASURE HYDRO-1**. To ensure water quality and intake systems are maintained during AIP control activities,

MITIGATION MEASURE UTILITY-1 shall be implemented to allow for appropriate coordination with service providers within one-quarter mile of the activity and ensure lines are appropriately protected.

3.20-2. Would the Project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? (CEQA XIXb)

No Impact. Potable water supplies are not needed to serve the Project. No impact.

3.20-3. Would the Project result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments? (CEQA XIXc)

Less than Significant with Mitigation Measures. Most control methods do not require wastewater treatment for operation; however, mechanical and suction dredging may require wastewater discharge of dredging spoil water. Since spoils impoundment basins can be used to then return settled waters to the groundwater, sewer connection is not always necessary or available. Additionally, the action would occur under the existing decontamination program for the Lake Tahoe Basin. Once it has been determined that dredging methods would be utilized in a specific area and the extent of the area defined (limited to previously dredged areas), it can be determined whether or not sewer disposal is feasible given the location and volume/rate of water to be discharged into the system. In most cases, the spoil water disposal methods previously used at a specific site would be used in the future. Appropriate coordination would be required with the receiving wastewater service provider in the treatment area to ensure systems are not overloaded and standards can be met prior to discharge. Implementation of **MITIGATION MEASURE HYDRO-1** ensures water quality standards are maintained and wastewater systems are not overloaded.

3.20-4. Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? (CEQA XIXd)

No Impact. There are no solid waste disposal needs generated by the project that exceed local capacity, infrastructure, or otherwise impair solid waste reduction goals. Removed plant material would be disposed, but would not be of a volume that would impact waste recovery infrastructure or reduction goals. Removing invasive plant populations while they are small, further reduces the volume of removed plants to be disposed; therefore, continued removal and monitoring of invasive plant species would help to reduce future volumes of removed plant material.

3.20-5. Would the Project comply with federal, state, and local management and reduction statutes and regulations related to solid waste? (CEQA XIXe)

No Impact. There are no solid waste disposal needs which could result in non-compliance with federal, state, or local statutes or regulations.

3.20-6. Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to power or natural gas? (TRPA 16a)

No. No new electric or natural gas systems are proposed or required to implement the Project. Equipment and machinery would primarily utilize battery and gasoline fuel. No connection to natural gas infrastructure in the area would be needed. The machinery used during treatment, such as boats, mechanical and suction dredging equipment, or other suction devices would not be connected to or tap into the power or natural gas infrastructure. The air compressor that would be needed to operate LFAs would require the use of small quantities of electricity when in operation. The air compressor would connect to an existing electrical outlet at the marina in which the system is located and no new electrical system or alteration to the electrical system would be needed. The energy used by the compressor would not be of a quantity that would significantly impact the existing infrastructure or system capacity,

3.20-7. Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to communication systems? (TRPA 16b)

No. No new demand for communications systems would be generated by the Project.

3.20-8. Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to utilize additional water which amount will exceed the maximum permitted capacity of the service provider? (TRPA 16c)

No. The Project would not utilize water utilities.

3.20-9. Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to utilize additional sewage treatment capacity which amount will exceed the maximum permitted capacity of the sewage treatment provider? (TRPA 16d)

No. There would be no requirement for the wastewater treatment provider to make a determination of capacity to service the Project because of the minor service needs and because the action would occur under the existing decontamination program for the Lake Tahoe Basin. The Project will not create a demand for new sewer infrastructure and will not require the construction of new or expanded facilities. No new or expanded entitlements are necessary.

3.20-10. Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to storm water drainage? (TRPA 16e)

No. The project would not use storm water drainage facilities or discharge to the storm water drainage system, and would not result in impervious coverage that would contribute to storm water runoff. Water suctioned during suction removal would return to the water body and would not be discharged to the storm drainage system. Likewise, water from other removal methods would not be discharged into the drainage system. Wet plant materials and equipment would drain at the control site.

3.20-11. Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to solid waste and disposal? (TRPA 16f)

No. Plant waste material would be disposed as solid waste; however, the plant materials would not be of a substantial quantity or volume that would result in the need for new or altered solid waste disposal systems. Removing invasive plant populations while they are small, further reduces the volume of removed plants to be disposed; therefore, continued removal and monitoring of invasive plant species would help to reduce future volumes of removed plant material.

3.20.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Utility impacts are evaluated in terms of NEPA Intensity Factor 2.

There are no direct, indirect or cumulative impacts of the proposed action in relation to utilities. No new utility easements are proposed or necessary.

3.20.5 Environmental Commitments and Mitigation Measures

The utilities analysis determines **MITIGATION MEASURE UTILITY-1**, in addition to **MITIGATION MEASURE HYDRO-1**, would be necessary to avoid potential impacts to utilities and services.

Mitigation Measure UTILITY-1: Service Provider Notification

Prior to implementation of control methods within one-quarter mile of a water intake, excluding hand removal and surveillance monitoring, **the project proponent and/or** Tahoe RCD shall notify the Tahoe Water Suppliers Association and the affected water provider that owns the intake of the proposed control activity, duration, and daily timing. Intake protection, notification, or other measures and conditions required by the service provider to maintain their infrastructure and service levels shall be implemented. No control activities within one-quarter mile of an intake shall occur until coordination is conducted and intake protection measures, if needed, are in place.

3.21 WILDFIRE

3.21.1 Setting

The Project would be conducted within the boundaries of Lake Tahoe, its associated marshes, and tributaries, including the Upper Truckee River and the Truckee River. The Lake Tahoe Bain includes lands within the very high fire hazard severity zone as determined by CalFire and other state and federal responsible agencies. While the risk within the water line of the lake and tributaries where Project activities would occur is low, the risk on adjacent land is very high.

California state park units in the Tahoe Basin are located on State Responsibility Land in Placer and El Dorado Counties. The California Department of Forestry and Fire Protection (CalFire) has primary jurisdiction for fire suppression in State Responsibility Land including units of the State Park System (CalFire 2007). Approximately 80 percent of the lands within the Tahoe Basin are owned and managed by the LTBMU. CalFire has an agreement with the LTBMU to provide fire protection to State Responsibility Lands in the Basin.

The size of the state and the numerous types of emergencies such as wildfires, floods, and earthquakes, require the cooperative efforts of federal, state, and local agencies. The LTBMU provides service to the entire Lake Tahoe Basin in California and Nevada. The Fire Protection Districts within Tahoe Basin work cooperatively with LTBMU and adjacent Fire Protection Districts.

The Nevada Division of Forestry provides wildfire protection statewide through its Wildland Fire Protection Program, which was approved by the Nevada State Legislature in 2013. The program was developed to defend the people and lands of Nevada against wildland fire through collaborative and comprehensive use of fire suppression, prevention and restoration resources available through the state. It works to address current challenges facing federal, state, and local governments which include fighting year-round wildland fires, escalating fire suppression costs, cheatgrass and other invasive species, expanding Wildland Urban Interfaces, scattered capabilities and jurisdictions, tight budgets, and declining federal resources and cost shifting.

The Wildland Fire Protection Program allows the State to provide financial assistance with wildland fire costs, increased suppression resources and coordination, incident management assistance, and technical expertise to participating counties during a wildfire. The Division also operates under cooperative agreements with federal agencies and other states.

3.21.2 Environmental Impacts of the No Action Alternative

The No Action alternative implements no AIP treatment and removal activities and therefore, would result in no direct or indirect effects to wildfire.

3.21.3 Environmental Impacts of the Proposed Project Alternative

Table 3.21-1: Wildfire

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
Is the Project located in or near state responsibility areas or lands classified as high fire hazard severity zones? Yes: X No:___				
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				X
3.21-1. Substantially impair an adopted emergency response plan or emergency evacuation plan? (CEQA XXa)				X
3.21-2. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? (CEQA XXb)				X
3.21-3. Require the installation of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? (CEQA XXc)				X
3.21-4. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? (CEQA XXd)				X

Discussion

3.21-1. Would the Project substantially impair an adopted emergency response plan or emergency evacuation plan? (CEQA XXa)

No Impact. Since the Project would not impact area roadways, it would not impair emergency response or evacuation plans. Control methods would not alter or interfere with implementation of federal, state, or local hazard mitigation plans or wildfire hazard policies. Individuals seeking to evacuate from a wildfire by boating into the lake and away from the shoreline would not be prevented from using water transport unless active installation or dredging is occurring in a marina. If a wildfire were to occur in the vicinity of active treatment, the treatment activity would temporarily stop to ensure the safety of the personnel.

3.21-2. Due to slope, prevailing winds, and other factors, would the Project exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? (CEQA XXb)

No Impact. The Project has no effect on wildfire risk as project activities are confined to aquatic areas.

3.21-3. Would the Project require the installation of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? (CEQA XXc)

No Impact. No installation of infrastructure is proposed. There is no wildfire risk associated with the installation or removal of temporary benthic barriers or installation and operation of LFAs.

3.21-4. Would the Project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? (CEQA XXd)

No Impact. Project activities are confined to aquatic areas. Additionally, the Project does not propose structures or dwellings that would expose people to such hazards.

3.21.4 NEPA Analysis of Effects

This section discloses the environmental impacts of the proposed action, which includes each of the proposed control methods described in the project description. Wildfire impacts are evaluated in terms of NEPA Intensity Factor 2.

There are no direct, indirect or cumulative effects of the proposed action on wildfire as aquatic invasive plant treatment would occur within the waterways of the Project Area. Equipment would primarily be located within the waters of Lake Tahoe, its tributaries or marshes. While some equipment could be located on the shoreline, there are little to no fuels in the shoreline that could be ignited. Most actions, particularly those in areas where there is vegetation along the waterline such as along the banks of rivers or creeks or within marshes, would consist of control methods that require no machinery capable of ignition. There are no indirect effects that would increase the risk of wildfire. While transporting materials and equipment to various control sites or the staging of such materials and equipment within parking lots would add new activity within the WUI, the risk of potential wildfire would not increase.

3.21.5 Environmental Commitments and Mitigation Measures

None.

3.22 MANDATORY FINDINGS OF SIGNIFICANCE

Table 3.22-1: Mandatory Findings of Significance

CEQA Environmental Checklist Item	Potentially Significant Impact	Less Than Significant with Mitigation Measures	Less Than Significant Impact	No Impact
3.22-1. Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory? (CEQA XXIa)		X		
3.22-2. Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? (CEQA XXIb)			X	
3.22-3. Does the Project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly? (CEQA XXIc)			X	
TRPA Initial Environmental Checklist Item	**Yes**	**No, With Mitigation**	**Data Insufficient**	**No**
3.22-4. Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California or		X		

Nevada history or prehistory? (TRPA 21a)				
3.22-5. Does the Project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.) (TRPA 21b)				**X**
3.22-6. Does the Project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environmental is significant?) (TRPA 21c)				**X**
3.22-7. Does the Project have environmental impacts which will cause substantial adverse effects on human being, either directly or indirectly? (TRPA 21d)				**X**

Discussion

3.22-1. Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory? (CEQA XXIa)

Less than Significant with Mitigation Measures. The Project was evaluated for potential significant adverse impacts to the natural environment and its plant and wildlife communities. The control sites support certain special status animal species and natural communities. The Project would have the potential to degrade the quality of the habitat and/or reduce the number or restrict the range of sensitive animals. The Project also would have the potential to degrade water quality by causing a release of fine sediments into the water column. However, full implementation of Project requirements and mitigation measures incorporated into this Project (**MITIGATION MEASURES AQ-1 and -2, BIO-1 through 5, CULT-1 through 3, HYDRO-1, HAZMAT-1 and -2, REC-1, TRANS-1, TRIBAL-1, and UTILITY-1**) would reduce those impacts, both individually and cumulatively, to a less than significant level.

This IS identifies the Project's potential impacts to biological resources, cultural resources, public safety, water quality, utilities and service systems, and transportation. Through the Project design, committed practices and monitoring, and when necessary, the proposed mitigation measures, the potential effects of such impacts would be reduced to a point that no significant impacts would occur. The Project does not have the potential to degrade the quality of the environment substantially, reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

3.22-2. Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? (CEQA XXIb)

Less than Significant Impact. "Cumulatively considerable" means that the incremental effects of the Project would be considerable when viewed in connection with the effects of past projects, the effects of other current projects and the effects of probable future projects. The projects that could have a cumulative impact on the resources in the Project Area, when considered incrementally with the Project, are referred to as "related projects" and are listed in Section 3.1 of this IS. Agencies contacted and documents referenced for development of this list include: TRPA, LTBMU, USACE, Lahontan, and Tahoe RCD.

The Project, when considered in context with other past, present and reasonably foreseeable future projects, would not create impacts that are individually limited but cumulatively considerable. The long-term effects of the Project will result in beneficial impacts to numerous resource areas, including water quality, biological resources, scenic quality, and recreation. Potential short-term Project related implementation impacts (e.g., increased localized turbidity, conflicts with recreational uses, potential to disturb cultural resources) will be offset by measures proposed as part of the Project description and where necessary, mitigation measures recommended in this Initial Study.

Without implementation of the Project, AIP infestations would be allowed to proliferate, contributing to a cumulatively considerable impact that would increase the difficulty in managing AIP populations. The "No Project" action would result in a cumulatively considerable impact and the Project would contribute to a cumulatively considerable beneficial ling-term impact.

CDPR, Nevada State Parks, LTBMU, NTPUD, the City of South Lake Tahoe and other land management entities often have maintenance programs, as well as rehabilitation, interpretation, and accessibility projects planned for areas adjacent to the Project Area. Potential impacts from environmental issues addressed in this Initial Study would not overlap in such a way as to result in cumulative impacts that are greater than the sum of the parts.

3.22-3. Does the Project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly? (CEQA XXIc)

Less than Significant Impact. The Project would not substantially affect humans. The Project directly benefits the natural environment, and thus indirectly the human environment, through identification, removal, disposal and long-term monitoring of AIP infestations in Lake Tahoe, its associated marshes, the Upper Truckee River, and the Truckee River.

13.22-4. Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California or Nevada history or prehistory? (TRPA 21a)

No, with Mitigation. See discussion and analysis for Question 3.22-1 above.

3.22-5. Does the Project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (TRPA 21b)

No. The Project has the potential to achieve both short-term and long-term goals equally. In the short term, AIP populations would decrease, while in the long term, with removal of AIP and ongoing efforts to control their populations, lake clarity and native habitat function would be maintained and improved.

3.22-6. Does the Project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environmental is significant?) (TRPA 21c)

No. See discussion and analysis for Question 3.22-2 above.

3.22-7. Does the Project have environmental impacts which will cause substantial adverse effects on human being, either directly or indirectly? (TRPA 21d)

No. See discussion and analysis for Question 3.22-3 above.

SECTION 4 RESOURCE PROTECTION MEASURES / ENVIRONMENTAL COMMITMENTS / MITIGATION MEASURES AND MONITORING REPORTING

The Project will not result in permanent adverse impacts to the environment and will provide environmental benefits to the Project Area. As a result of control methods and activities located within the shorezone, nearshore, SEZ, and 100-year floodplain of Lake Tahoe, area marshes, the Upper Truckee River and Truckee River corridors, short-term impacts to Air Quality, Biological and Cultural/Tribal Resources, Public Safety, Hydrology and Water Quality, Transportation and Recreation resources may occur during Project implementation. Mitigation measures listed in Table 4-1 includes environmental commitments and resource protection measures (RPMs) that will reduce potentially significant environmental impacts to a less than significant level and prevent adverse impacts. For the purposes of this document mitigation measures are considered RPMs that will be implemented as part of the project where applicable. **Table 4-1 lists Tahoe RCD as the implementing and monitoring entity, but other partner agencies may implement AIP control projects, and if so, would be responsible for implementing and monitoring the applicable RPMs.**

Table 4-1

Mitigation and Monitoring Reporting Program for the Proposed Project Alternative

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
Air Quality	Suction and Mechanical Dredging	**AQ-1 Idling Restrictions** The dredging contractors shall minimize idling time of heavy dredging equipment by: 1. Shutting equipment off when not in use or reducing the time of idling to 5 minutes, as required by Title 13, Sections 2449(d) and 2485 of the California Code of Regulations; 2. Prohibiting idling within 1,000 feet of sensitive receptors, such as schools, care centers, and residences; and 3. Educating workers of the idling restrictions discussed above.	Tahoe RCD	Tahoe RCD, TRPA	During control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
Air Quality	Suction and Mechanical Dredging	**AQ-2 Dust Control Measures** 1. Minimize creation of fugitive dust where dredging equipment or disposal bins are located on land by applying water to exposed soils. 2. Vehicles accessing control areas over unpaved surfaces shall limit their speed to 5 miles per hour. 3. Paved staging areas shall be swept clean following implementation of control actions using staging areas for material or equipment storage.	Tahoe RCD	Tahoe RCD, TRPA	During control implementation	
Biological Resources	All Methods Except Hand Removal and Surveillance Within All Control Sites	**BIO-1: Sensitive Plant Protection** 1. For work to be performed in tributaries, marshes, the near shores of Lake Tahoe, as well as access and staging areas (up to a 50 foot buffer), review of past records and/or pre-implementation surveys shall be performed to determine the presence of sensitive (TEPCS) plant species prior to commencement of AIP control actions. AIP treatment areas, including staging and access locations that include potential habitat, shall be surveyed by a qualified biologist for sensitive plant species during a time when their morphological characteristics are visible. Surveys for AIP treatment sites shall be considered valid for five (5) years from the date of the survey for upland species. If TEPCS plant species are present, the LTBMU, California Department of Fish and Wildlife, Nevada Department of Conservation and Natural Resources and/or TRPA biological staff, as	Tahoe RCD	Tahoe RCD, TRPA, LTBMU, USFWS	Prior to and during control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		necessary, shall be contacted to specify which resource protection measure shall be implemented, which may include avoidance, exclusion, or time of year limitations to be implemented to eliminate impacts to individuals or occupied habitat. Protection measures may entail installation of protection fencing to allow for establishment of avoidance areas and buffers to protect individuals and habitat. Implementation of the Proposed Action shall not commence without the agreed upon protection measures in place to protect sensitive species. 2. Tahoe yellow cress (TYC) shall be avoided. If treatment work is planned for mid-May or after, TYC surveys shall occur prior to, but in the same growing season as AIP treatment implementation. If treatment work is planned in April or early May, TYC surveys shall be conducted at the end of the prior year growing season. Known occupied sites (established or new detections) of Tahoe yellow cress shall be avoided and protected using fencing so as to not disturb individuals (submerged or terrestrial) and/or surrounding habitat up to 50 feet from project activities. Dredging shall not be performed adjacent to or within known or located TYC sites so as to prevent impacts to individuals. Diver assisted suction removal shall also be limited to areas outside TYC sites to limit impacts to submerged rootstock.				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		Hand pulling is the preferred method for AIP treatments within TYC sites. 3. Disturbance at access and staging areas shall be minimized by using or accessing only the area needed to access the treatment site or store materials used for AIP removal. While areas with TEPCS plants shall be avoided when establishing access routes and staging areas, as discussed in measures 1 and 2 above, the access and staging areas shall be confined to existing disturbed areas, as feasible, where TEPCS plants are not located, such as parking lots, piers, or other paved or previously disturbed areas. Fencing shall be placed around stored materials in the staging areas to contain the materials and access to the materials. In areas where paved areas, piers, or disturbed trails are not present, staging and access shall be limited to areas of the least disturbance where no TEPCS species are present and outside of TEPCS buffer areas. These areas shall be limited to the minimum staging necessary for the equipment and materials used in AIP removal and access shall be limited and marked to the minimum width and length necessary based on the control method. 4. Specific pre-implementation and post-implementation monitoring evaluations of disturbed areas and success of revegetation in staging areas shall be conducted, if necessary.				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
Biological Resources	All Methods Except Hand Removal and Surveillance Within All Control Sites	**BIO-2: Terrestrial Wildlife Species Surveys and Limited Operating Periods** 1. Limited Operating Periods (LOP) for FSS and TRPA Special Interest Species shall be maintained when it is determined that AIP control actions would occur within nest buffer zones or winter management zones and disturb individuals. The current list of LOPs is in Appendix C of the Wildlife BE. LOPs may be updated prior to implementation if species lists change or if LOPs for an individual species change independent of this. 2. If project activities are located within a northern goshawk Protected Activity Center (PAC), prior to commencement of project activities, it shall be determined if the PAC is active and/or if nesting is occurring. If the PAC is active (with known current or recent history of nesting activity), a **permitting agency approved** biologist shall determine based on the nature of the specific project activity if a limited operating period shall be required. If the PAC is not considered active the proposed activity shall be allowed to proceed. 3. In suitable habitat and habitat with historic detections of willow flycatchers **(as defined by the permitting agency approved biologist)**, conduct surveys for the species the season before or the same season as (but before) proposed project activities. If willow flycatchers are detected during surveys, implement the	Tahoe RCD	Tahoe RCD, TRPA, LTBMU, USFWS	Prior to control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		LOP to protect nesting individuals (see Wildlife BE Appendix C). 4. Nesting bird surveys shall be conducted no more than 30 days prior to project activities if work would occur near nesting features or within suitable habitat **<u>(as defined by the permitting agency approved biologist)</u>** during the breeding season (generally April to August). If a nest is detected and it is determined that the nesting individual would be disturbed by project activities, develop species-specific measures to prevent disturbance. Measures would generally involve a 50-foot disturbance buffer around a nest, which may vary based on the nesting species, or a delay in project activities. Areas within the buffer could be accessed after the birds fledge, typically after August 15.				
Biological Resources	All Methods Except Hand Removal and Surveillance Within Previously Unsurveyed Control Sites with SNYLF Habitat	**BIO-3: Sierra Nevada Yellow-Legged Frog Surveys and Protection** 1. In areas with potential habitat, specifically Lake Tahoe marshes and tributaries as depicted in Figure 3.5-1, one (1) to three (3) protocol surveys for SNYLF shall be conducted at previously un-surveyed AIP control sites prior to the start of AIP control actions. Three surveys will be conducted if previously un-surveyed habitat is determined to be suitable. One survey may be conducted if previously un-surveyed habitat is determined to be unsuitable during the first survey. As stated in the USFS	Tahoe RCD	Tahoe RCD, TRPA, LTBMU, USFWS	Prior to and during control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		Programmatic Biological Opinion (FF08ESMF00-2014-F-0557) the surveys will be within the last 10 years, can be staggered during one season from 14 calendar days after the date snowmelt begins through September 15 (early, mid, late season) or conducted over three seasons during separate consecutive years. At least one of the surveys will be conducted during a calendar year where snowpack is 80 percent or greater than normal. Surveys shall begin eight (8) weeks prior to work and finish with a pre-treatment survey within a week of the start of AIP control actions. If SNYLF are detected, Forest Service and USFWS biologist shall be notified and together shall identify the appropriate resource protection measure that shall be implemented to avoid disturbance to SNYLF before starting the treatment, such as biological monitoring during treatment work, spatial adjustment of treatments, adjustments to treatment timing, adjustments to equipment or treatment protocols, and change of treatment method or approach. 2. Personnel conducting AIP control actions shall be trained to identify and be aware of the potential presence of SNYLF and to minimize impacts to the species. If SNYLF are detected, AIP control actions shall temporarily cease and USFS and USFWS biologists shall be notified. Prevention of project impacts through implementation of resource protection measures, such as biological monitoring				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		during treatment work, spatial adjustment of treatments, adjustments to treatment timing, adjustments to equipment or treatment protocols, and change of treatment method or approach, shall be addressed before resuming the treatment.				
Biological Resources	All Methods Except Hand Removal and Surveillance Within TRPA Identified Prime Fish Habitat, Occupied Habitat, or Migration Corridors for These Species.	**BIO-4: Lahontan Cutthroat Trout, Lahontan Lake Tui Chub, and Native Fish Protection** During implementation of AIP control actions, project scientists, technicians, divers, and equipment operators shall avoid disturbance and harm to LCT, Lahontan lake tui chub, and other spawning native fish by following these guidelines: 1. Prior to implementing control methods, control sites shall be monitored to identify presence of fish species to avoid aggregations of breeding native fish. Native fish primarily spawn from April – July in tributaries and areas identified as TRPA designated Prime Fish Habitat (TRPA 2015), and some native fish may spawn on or near aquatic vegetation. Therefore, if pre-implementation monitoring identifies presence of native fish, the area shall be avoided between April and July. 2. Avoid blockage of tributary mouths and confluences for multi-day periods during the April-July breeding season. Benthic barriers, silt curtains, and LFA equipment have the greatest potential to form barriers to migrating fish and their use shall be limited to maintain passage	Tahoe RCD	Tahoe RCD, TRPA, LTBMU, USFWS	During control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		between April to July within tributary mouths and confluences. 3. Minimize fish harassment and exercise caution when conducting treatments near LCT re-introduction sites. Fish harassment can be minimized by monitoring the area for fish activity, avoiding areas with fish presence and moving to another area within the control site, temporarily stopping activity until fish have moved out of the area, and reducing the intensity of removal activity in the area. Divers shall be trained to avoid interaction with fish, shall not pursue or antagonize fish to leave the area, and shall not collect, trap, or harm fish while conducting AIP removal activities.				
Biological Resources	Diver Assisted Suction Removal on National Forest Lands	**BIO-5: Great Basin Rams-Horn Snail Protection** Since Great Basin ramshorn snail is a Forest Service sensitive species, but not state or otherwise federally listed, full avoidance of the species in all areas is not required; however, protection measures are proposed on National Forest System lands. While hand-pulling and diver-assisted suction removal would not injure species individuals, divers conducting treatments or operating equipment in benthic sediments on National Forest System lands shall familiarize themselves with the identification of Great Basin ramshorn snail. If species are detected during implementation activities, specifically diver assisted suction removal, divers will avoid incidental injury or mortality to the species where feasible. This	Tahoe RCD	Tahoe RCD, TRPA, LTBMU, USFWS	During control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		may include inspecting plants prior to removal to ensure the species is not on the AIP to be removed, and where feasible removing the species from AIP prior to suctioning. Divers will record the presence of Great Basin ramshorn snails when encountered during treatment work and report to U.S. Forest Service biologists. If further AIP removal within areas of known presence is needed, the records shall be reviewed with the U.S. Forest Service to identify appropriate protection measures before work is continued based on the location, extent, and methods to be used				
Cultural Resources	All Methods Within All Control Sites	**CULT-1: Unanticipated Discovery** 1. In the event of an unanticipated discovery of previously-undocumented cultural resources during project activities, work will be suspended in the area until the Lake Tahoe Basin Management Unit (LTBMU) Heritage Program Manager (HPM) or US Army Corps of Engineers (USACE) Cultural Resources Specialist (CRS), or TRPA/applicable State Historic Preservation Officer (SHPO) can assess the find and develop and implement appropriate avoidance, preservation, or recovery measures. If archaeological or paleontological features are discovered during project implementation, all submerged artifacts and/or features will be marked, left in place, and reported to the appropriate HPM, CRS, or SHPO. Pursuant to TRPA Code of Ordinances Sections 67.3 and 67.4, upon discovery of a site, object, district, structure, or other resource, potentially meeting the criteria of Section 67.6, all operations shall stop	Tahoe RCD	Tahoe RCD, TRPA, LTBMU ACOE,	During control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		until a qualified archaeologist has evaluated the potential significance of the resource, and TRPA shall consider the resource for designation as a historic resource and shall consult with the applicable SHPO, and with the Washoe Tribe if it is a Washoe site. If the resource initially is determined to be eligible for designation as a historic resource by the SHPO, TRPA shall consider designation pursuant to Section 67.6 and 67.5 of the TRPA Code of Ordinances and a resource protection plan developed pursuant to Section 67.3 of the TRPA Code of Ordinances. 2. In the event that human remains are discovered during project activity, work will cease immediately in the area of the find and the project manager/site supervisor will notify the appropriate personnel. Any human remains and/or funerary objects will be left in place. Existing law requires that project managers contact the County Coroner. If the County Coroner determines the remains are of Native American origin, both the Native American Heritage Commission (NAHC) and any identified descendants shall be notified (Health & Safety Code, § 7050.5; Pub. Res., Public Resources Code, §§ §5097.97 and 5097.98). 3. Tahoe RCD staff will work closely with the U.S. Army Corps of Engineers and the LTBMU or designated CRS to ensure that its response to such a discovery is also compliant with federal requirements including the Native American Graves				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		Protection and Repatriation Act. Work will not resume in the area of the find until proper disposition is complete (Pub. Res. Code, PRC §5097.98). 4. No human remains or funerary objects will be cleaned, photographed, analyzed, or removed from the site prior to determination. If it is determined the find indicates a sacred or religious site, the site will be avoided to the maximum extent practicable. Formal consultation with the State Historic Preservation Office and review by the NAHC/Tribal Cultural representatives will occur as necessary to define additional avoidance, preservation, or recovery measures, or further future restrictions. 5. If treatment involves disturbance of the lake bottom in culturally sensitive areas, an underwater archaeological survey will be conducted by a qualified SOI archaeologist underwater specialist in the project Area of Potential Effect (APE) to determine if previously recorded or newly identified cultural resources exist in the area. Results of the survey will be documented in an archaeological survey report and submitted to land agencies and the appropriate Information Center.				
Cultural Resources	All Methods Within or Near Historic Properties	**CULT-2: Class 1 Avoidance** 1. Proposed activities shall avoid historic properties. Avoidance means that no activities associated with undertakings that may affect historic properties, unless specifically identified in this Measure as approved Class 2 On-Site Management Measures, shall occur within historic property boundaries, including any defined	Tahoe RCD	Tahoe RCD, TRPA, LTBMU ACOE,	Prior to and during control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		buffer zones. Portions of AIP activities may need to be modified, redesigned, or eliminated to properly avoid historic properties. All activities performed under Class 1 Avoidance must be documented. 2. To the extent possible, historic properties within the APE shall be clearly delineated prior to implementing any associated activities that have the potential to affect historic properties. 3. Buffer zones may be established to ensure added protection. The use of buffer zones to avoid historic properties may be applicable where setting contributes to property eligibility under 36 CFR 60.4, or where setting may be an important attribute of a historic properties or where heavy equipment is used in proximity to historic properties.				
Cultural Resources	All Methods Within Historic Properties	**CULT-3: Class 2 On-site Historic Property Management Measures** 1. Written approval for a proposed ground disturbing activity within or adjacent to the boundaries of a historic property will be based the LTBMU HPM or USACE CRS or other delegated qualified Cultural Resource Specialist, who is a Secretary of Interior qualified archaeologist, professional judgement and will be made on such activities that will not have an adverse effect on historic properties, or under carefully controlled conditions such as those specified below. All activities performed as Class 2 On-Site Historic Property Management Measures must be documented. Additional on-site archaeological monitoring may be required	Tahoe RCD	Tahoe RCD, TRPA, LTBMU ACOE,	Prior to and during control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		to test the effectiveness of management measures. 2. Management Measures: a. All concentrated work areas (e.g., staging areas, turnarounds, and equipment sites) shall be located outside historic property boundaries. b. Placement of foreign, non-archaeological material (e.g., padding or filter cloth) within transportation corridors (e.g., designated roads or trails, staging areas, equipment sites, boat ramps, etc.) over archaeological deposits or historic features to prevent surface and subsurface impacts caused by vehicles or equipment. Such foreign material may be utilized on historic properties under the following conditions: • Design the foreign material depth to acceptable professional standards; • Design the foreign material use to assure that there will be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; and				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		• The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date. c. No skidding nor tracked equipment shall be allowed within historic property boundaries. d. Placement of barriers within or adjacent to site boundaries to prevent access to or disturbance of deposits or historic features, or for protection of other sensitive resources on-site, when such barriers do not disturb subsurface deposits or lead to other effects to the site. e. A CRS shall approve the use of tracked equipment to remove vegetation from within specifically identified areas of site boundaries under prescribed measures designed to prevent or minimize effects. f. A CRS shall determine whether mechanical equipment treatments within site boundaries shall be monitored, and how such monitoring shall occur. g. If standard management measures cannot provide appropriate protection, undertakings shall be subject to the provisions of 36 CFR part 800.				
Public Safety	All Methods Except Hand Removal and Surveillance Within All Control Sites	**HAZMAT-1: Spill Prevention and Response** 1. Prior to the start of project activities, equipment and vehicles shall be clean and serviced. Routine vehicle and equipment checks will be conducted during the project to ensure proper	Tahoe RCD	Tahoe RCD, TRPA, City of South Lake Tahoe	Prior to and during control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		operating conditions and to avoid any leaks. 2. Contaminated residue or other hazardous compounds shall be contained and disposed of outside of the boundaries of the site at a lawfully permitted or authorized site. 3. Boats and barges used in project activities shall have an Emergency Spill Response Plan and clean up kit. **Spill response training shall be required for all personnel operating equipment with the potential to spill. Included in the Emergency Spill Response Plan and clean up kit should be enough absorbent material to encircle the largest vessel used for AIP control operations.**				
Public Safety	All Methods Used Within the Lake Tahoe Airport Property or Runway Zone	**HAZMAT-2:Airport Safety Plan and Coordination** 1. Prior to the start of project activities within the airport property and runway safety zones, coordination with the Lake Tahoe Airport shall occur to determine schedule, disclose activities planned for the portions of the Upper Truckee River within airport property, identify if a right of entry agreement is required, and implement any conditions or measures required by the airport. 2. If implementation of control methods is necessary, obtain a right of entry agreement and associated appropriate insurance as required by the airport prior to treatment implementation.	Tahoe RCD	Tahoe RCD, TRPA, City of South Lake Tahoe	Prior to and during control implementation on airport property	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		3. Monitoring and treatment personnel shall notify the airport when they arrive, depart, or are working in the area. 4. Inspections shall be completed on foot and personnel shall not drive around the airport to each monitoring point. Personnel shall schedule vehicle access, if needed, by airport staff. 5. While on the airport property, personnel shall stay off active pavement, wear a reflective vest, and coordinate with airport staff to open gates to gain access to the western side of the Upper Truckee River. 6. In coordination with airport personnel, safety protocol shall be implemented and adhered to at all times when working on airport property.				
Hydrology and Water Quality	All Methods except Hand Removal and Surveillance Within All Control Sites	**HYDRO-1: Water Quality Compliance and Monitoring** **1) Measures Applicable to All Methods:** a) The monitoring and protection measures in Sections 2.4.3 and 2.4.4 in the project description shall be implemented. b) An HACCP Plan shall be implemented to ensure water quality. i) THP samples will be taken for any spill or visible oil sheen. All analysis will be performed by certified laboratory or an approved method of testing, as define by State Statutes, with appropriate reporting limits specific to Tahoe area. ii)The permittee shall ensure appropriate best management	Tahoe RCD	Tahoe RCD, TRPA, USACE, Lahontan, CDFW, CASLC, NDEP, NVDSL	Prior to and during control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		practices are in place to ensure the removed material is appropriately transported out of the Tahoe Basin. Any potential hazardous material associated with vehicles, boats, motors or diver's supplies, or general removal operations from other potential contaminating material shall be contained and removal, and a spill contingency plan is prepared with appropriate emergency contacts, including nearby water suppliers, are included onsite. c) A copy of the applicable permits for the control method used and the HACCP shall be kept onsite during implementation. Implementing staff and contractors shall be trained on the content and requirements of those documents and shall refer to the requirements throughout implementation. The permittee is responsible for all authorized work and ensuring that all contractors and workers are made aware of and adhere to the terms and conditions of the permit authorization relating to water quality. d) Neither Project construction activities nor operation of the Project may cause a violation of the Water Quality Control Plan for the Lahontan Region (Basin Plan); may cause a condition or threatened condition of pollution or nuisance; or cause any other violation of the California Water Code (CWC). e) This project is subject to the acquisition of all local, regional, state,				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		and federal permits and approvals as required by law. Failure to meet any conditions contained herein or any conditions contained in any other permit or approval may result in permit revocation and civil or criminal liability. f) Shall comply with the Project Conditions of TRPA Permit EIPC2009-0002, as amended or superseded for the control action, and specifically the following: i) Monitoring: Water quality monitoring will be required to determine the effects of the removal operations and identify possible mitigation measures. Monitoring is for both environmental thresholds (turbidity and clarity) and to protect public drinking water sources. Water quality monitoring for turbidity is also included as a project measure (See Section 2.4.3.2 above). Rather than imposing a specific turbidity level to be maintained directly around the removal operations, the monitoring will be in zones from the work area: Zone 1: This zone closest to the dive operations allows for elevated turbidity within a 25 foot radius of the suction equipment and for levels up to 50 NTU. At levels over 50 operations will cease for 15 minutes OR until levels drop below 25. Zone 2: Turbidity monitoring will also occur at the midpoint between the 25 foot zone and any intake within 0.25				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		mile from the control site. Any elevation over 10 NTU at this location operation will cease for 15 minutes OR until levels drop below 5. Zone 3: This area within 100 foot of the intake shall not exceed 1 NTU or operations will cease with emergency notification of the closest intake operator followed by NDEP and other operators, and other emergency contacts. Operations will be reviewed and evaluated prior to resumption of work. ii) Bacteria are also a concern for the intakes and while this operation should not increase background levels, sampling will be made within any visible plume. iii) Turbidity readings shall be recorded regularly during work hours or at a minimum before, during and after suction removal operations. The reading shall be taken at the 25-foot buffer surrounding operations and at the midpoint between the removal and intake lines within 0.25 mile of the control site. Water intakes monitoring will be at the surface and at depth near the withdrawal point. iv) Disturbance shall be kept to the minimum necessary for operations. v) All equipment, including boats shall be clean prior to entry into Lake Tahoe. This could be waived for any boat if the operator can show proof of decontamination or use, exclusive to Lake Tahoe.				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		vi) Drinking water intakes shall be identified and mapped according to the TRPA Code Chapter 60, and comments solicited from the intake operator for proposed actions. The actual location of the drinking water withdrawal is not to be released to any public or private entity due to Homeland Security restrictions. vii) Removed plant material shall be covered with a tarp or placed in an appropriate device to ensure no plant materials fall into the waterway while transporting plant remnants to the staging area for disposal. Removed plant material shall be appropriately placed in the refuse bins. Any plant material spilled during the transfer from the boat, to the boat camp dock, to the refuse bins shall be raked/picked up and disposed of within the bins provided at the close of each workday. viii) Following implementation, documentation shall include final maps and project data results and photos of operation, evaluation of any impacts experienced during the removal, and documentation that the plant remnants were removed to a TRPA approved disposal site. vix) Project materials shall be properly stored to avoid spillage into waterways, hazardous materials shall be contained, and debris shall be disposed offsite. No litter or debris shall be dumped into waterways and				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		shall be removed daily and dispose of at an appropriate disposal site. g) Control methods shall implement the permit conditions established in the permits applicable to that control method as shown in Figure 2-2: i) Diver Assisted Suction Removal: TRPA Permit, Section 10, CDWF LSAA (CA), and either CA State Lands Lease or NV State Lands Management License. ii) Benthic Barriers: TRPA Permit, Section 404/NWP 27, Section 401 (Lahontan – CA or NDEP – NV), CDWF LSAA (CA) or NDEP Working in Waterways (NV), and either CA State Lands Lease or NV State Lands Management License. iii) UVC Light: TRPA Permit and Section 10. iv) LFA: TRPA Permit, Section 404/NWP 5, Section 401 (Lahontan – CA or NDEP – NV), Secti0n 402/NPDES, and CDWF LSAA (CA). v) Dredging: TRPA Permit, Section 404/NWP 27, TRPA/Lahontan MOU, Section 401 (Lahontan – CA or NDEP – NV), CDWF LSAA (CA) or NDEP Working in Waterways (NV), and either CA State Lands Lease or NV State Lands Management License. **2) AIP Control Methods that Employ Motorized Boats and Equipment**				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		a) All boats and equipment shall be cleaned and appropriately inspected prior to entering any waterway. i) Equipment must be clean and free from oil, grease and loose metal material and must be removed from service, if necessary, to protect water quality. ii) Petroleum products must be stored in watertight containers with appropriate secondary containment to prevent any spillage or leakage and protected from precipitation and surface run-off. iii) Vessels and equipment must be monitored for leaks, and proper BMPs must be implemented should leaks be detected, or the vessel/equipment must be removed from service, if necessary, to protect water quality. iv) The Applicant must immediately notify permitting agencies by telephone whenever an adverse condition occurs as a result of discharge. Such a condition includes, but is not limited to, a violation of the permit conditions, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. A written notification of the adverse condition must be provided within two weeks of occurrence. The written notification must identify the adverse condition, describe the actions completed or necessary to				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		remedy the condition, and specify a timetable, subject to any modifications by Water Board staff, for the remedial actions, if not already accomplished. v) An emergency spill kit must always be at the Project site during the Project. b) Storage of equipment shall occur in designated areas to ensure materials used to operate the equipment is not washed into the waterway and debris is appropriately removed. c) Permit agency staff will be allowed access onsite to review the permit and inspect equipment and methodology upon presentation of credentials. d) During periods of small craft wind advisory, or other hazardous weather advisory, the operation may be curtailed, cancelled, or rescheduled. **3) AIP Control Methods Requiring Agreement for Work within State Public Right of Way** a) For California project locations, requiring a CASLC Lease Agreement, the Applicant shall comply with the following conditions specific to protection of water quality: i) Identify whatever provisions are proposed for sewage disposal from boats, commercial uses, etc. If none, please identify the nearest pump-out facility, by name, location, and operating hours. ii) Identify whatever provisions are proposed for recycling and/or				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		litter/garbage disposal, including frequency of pick-up. iii) Identify any proposed fueling facility and fully describe spill prevention and control features. Are fueling stations such that they are accessible by boat without entering or passing through the main berthing area, in order to avoid collisions? Provide a spill contingency plan and list equipment and training needed to implement the plan. iv) Identify the location of any engine and hull washing activities, expected numbers of washings and the types of detergents proposed for use. Only phosphate-free and biodegradable detergents should be used for boat washing. v) Describe any proposed pollution control measures for vessel maintenance and haul-out facilities. Examples include: • Use of tarps and vacuums to collect solid wastes produced by cleaning and repair of boats. Such wastes should be prevented from entering adjacent water. • Vacuum or sweep up and catch debris, sawdust, sandings, and trash from boat maintenance areas on a regular basis so that runoff will not carry it into the water. • An oil/water separator should be used on outside drains and				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		be maintained to ensure performance. • Tarps should be used to catch spills of paints, solvents, or other liquid materials used in the repair or maintenance of boats. • Used antifreeze should be stored in a barrel labeled "Waste Antifreeze Only" and should be recycled. vi) Describe any special measures proposed to control the quality and quantity of urban and other runoff from surrounding areas. vii) Identification and estimate of amounts and persistence of contaminants which may be released from the sediments during dredging, and during construction and operation and maintenance of the proposed project. viii) The method and location of disposal of dredged materials. ix) During dredging operations, indicate how turbidity can be minimized (e.g., through the proper placement of silt screens or turbidity curtains). x) Statement of the proposed liquid, solid or gaseous waste disposal methods necessary for the protection and preservation of existing land and water uses. b) For Nevada project locations, requiring a NVDSL State-Owned Submerged Lands Certification, the Applicant shall				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		comply with the following conditions specific to protection of water quality: i) BMPs shall be applied and precautions shall be taken: to prevent and control releases of debris, sediment, any transport of sediments, and to prevent and control turbidity in the Lake during the project activities. ii) Disturbance to the lakebed shall be kept to a minimum. iii) There shall be no discharge of substances that would cause a violation of water quality standards of Lake Tahoe or the State of Nevada. iv) Any heavy equipment (barge, crane, etc.) to be used in the lake and shorezone areas must be steam cleaned at least once before working in Lake Tahoe or adjacent areas. All equipment shall be cleaned to ensure no contamination of invasive species (i.e. quagga mussels). All equipment shall be inspected for leaks daily prior to use. All leaks shall be repaired immediately. All equipment fueling and storage of fuels shall be conducted offsite and at least 200 feet away from the Lake. v) If a visible sediment plume or hydrocarbon sheen results from project activities, the work shall cease and NDSL shall be notified as soon as practicable of any release. All hydrocarbon sheens or releases shall be reported to the				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		NDEP Spill Reporting Hotline within 24 hours of occurrence at 1-888-331-6337. c) For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project including information on the location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented. **4) UV-C Light Treatment** a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 27 authorization under CWA Section 10. Sufficient justification shall be provided to determine that the proposed activity would result in a net increase in aquatic resource functions and services. Functions and services to be considered in the justification include, but are not limited to: cycling of nutrients, retention of particulates, export of organic carbon, and maintenance of plant and animal communities. b) For Nevada project locations requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented.				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		c) **To ensure control work does not create harmful algal blooms that could pose a risk to humans and animals, visual monitoring for evidence of HABs shall take place following treatment. If site indicators (discolored water, floating algae mats, surface scum, spilled paint appearance on water surface) indicate the potential presence of a HAB, the project proponent should initiate a sampling plan to collect and analyze water samples to determine the presence of harmful algae (cyanobacteria) and any associated cyanotoxins within the treatment area. A tiered analysis approach can be used to determine if cyanotoxins (microcystin, anatoxin-a, and cylindrospermopsin) are present at levels that may pose health risks to humans and animals. If sampling results indicate that levels of cyanotoxins are present above trigger levels established for the protection of human and animal health, appropriate signage shall be posted to advise recreators of the potential health risks.** d) **To ensure control work does not harm benthic macroinvertebrates, the Water Board may require a BMI survey pre- and post-treatment to ensure there is no long-term adverse impact to the BMI community in the event that UV-C Light treatment is deployed later in the growing season**				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		when there is a greater plant biomass being treated. e) **To ensure control work does not increase water temperatures, the Water Board may request temperature monitoring with field probes to ensure there are no long-term adverse changes to ambient water temperature that may impact beneficial uses, depending on the size and extent of the UV-C Light treatment.** 5) **Laminar Flow/Aeration** a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 5 authorization under CWA Section 404 (SPK-2019-00340, as amended or superseded for the control action). b) For California project locations, shall comply with CWA Section 401 WQC Standard Conditions, and Additional Conditions (Pursuant to CCR Title 23, Section 3859(a)) of Lahontan Water Board Order No. R6T-2020-0032, as amended or superseded. c) For Nevada project locations, shall submit for CWA Section 401 WQC with NDEP and shall identify implementation of BMPs for avoidance and minimization of impacts to waters of the State, including sediment and erosion control measures, habitat preservation, project scheduling, flow diversions, dewatering, and hazardous materials management. For Nevada project locations, requiring NDEP				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project including information on the location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented. **6) Hand Suction Removal** a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 27 authorization under CWA Section 10. Sufficient justification shall be provided to determine that the proposed activity would result in a net increase in aquatic resource functions and services. Functions and services to be considered in the justification include, but are not limited to: cycling of nutrients, retention of particulates, export of organic carbon, and maintenance of plant and animal communities. b) For California project locations, shall comply with CWA Section 401 WQC Standard Conditions, and Additional Conditions (Pursuant to CCR Title 23, Section 3859(a)) of Lahontan Water Board Order No. R6T-2020-0032, as amended or superseded (California) for the control action. c) For Nevada project locations, shall submit for CWA Section 401 WQC with NDEP and shall identify implementation of BMPs for avoidance and minimization of impacts to waters of the State, including sediment and				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		erosion control measures, habitat preservation, project scheduling, flow diversions, dewatering, and hazardous materials management. For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented. d) Shall implement water quality protection measures required by CDFW LSA/SAA Agreement for Routine Maintenance (1600-2014-0082-R2, as amended or superseded). If conditions arise, or change in such a manner as to be considered deleterious to the stream or wildlife, operations shall cease until approved corrective measures are taken. e) Shall comply with the Project Conditions of TRPA Permit EIPC2009-0002, as amended or superseded (See 1# above for additional specific requirements). The collected plant material is conveyed to an approved staging area. Hand pulled fragments escaping the vacuum-assisted collection method will be removed by hand/vacuum suction as reasonably practicable before the close of each day. **7) Benthic Barriers** a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 27 authorization under CWA Section 404 (SPK-2019-				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		00340, as amended). Sufficient justification shall be provided to determine that the proposed activity would result in a net increase in aquatic resource functions and services. Functions and services to be considered in the justification include, but are not limited to: cycling of nutrients, retention of particulates, export of organic carbon, and maintenance of plant and animal communities. b) For California project locations, shall comply with CWA Section 401 WQC Standard Conditions, and Additional Conditions (Pursuant to CCR Title 23, Section 3859(a)) of Lahontan Water Board Order No. R6T-2020-0032, as amended or superseded (California) for the control action. c) For Nevada project locations, shall submit for CWA Section 401 WQC with NDEP and shall identify implementation of BMPs for avoidance and minimization of impacts to waters of the State, including sediment and erosion control measures, habitat preservation, project scheduling, flow diversions, dewatering, and hazardous materials management. For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project including information on the location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented.				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		d) Shall implement water quality protection measures required by CDFW LSA/SAA Agreement for Routine Maintenance (1600-2014-0082-R2, as amended or superseded), Permittee shall take precautions to minimize turbidity/siltation during installation and removal of the benthic barriers and during all removal activities. Precautions shall include, but are not limited to: pre-project planning to identify site specific turbidity and siltation minimization measures; best management erosion control practices during project activity; and settling, filtering, or otherwise treating silty and turbid water prior to discharge into a lake or stream. e) Shall comply with the Project Conditions of TRPA Permit EIPC2009-0002, as amended or superseded. **8) Hydraulic and Mechanical Dredging** a) Shall comply with the General Conditions and Regional Conditions for Nevada and the Lake Tahoe Basin in California for NWP 27 authorization under CWA Section 404 (SPK-2019-00340, as amended), specifically the following conditions: i) For all dewatering activities that propose structures or fill in waters of the U.S. that require authorization from the Corps: (1) The proposed methods for dewatering; (2) The equipment that would be used to conduct the dewatering; (3) The length of time the area is proposed to be				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		dewatered; (4) The area (in acres) and length (in linear feet) in waters of the U.S. of the structure and/or fill; (5) The method for removal of the structures and/or fill; and (6) The method for restoration of the waters of the U.S. affected by the structure or fill following construction. ii) Sufficient justification to determine that the proposed activity would result in a net increase in aquatic resource functions and services. Functions and services to be considered in the justification include, but are not limited to: cycling of nutrients, retention of particulates, export of organic carbon, and maintenance of plant and animal communities. iii) Unless determined to be not practicable by the Corps, no dredged and/or fill material shall be discharged within standing or flowing waters. For ephemeral or intermittent drainages (e.g. natural or relocated streams, creeks, rivers), this may be accomplished through construction during the dry season. In perennial drainages, this may be accomplished through dewatering of the work area. All dewatering shall be conducted to allow fish and wildlife passage during construction. All dewatering structures and/or fills shall be removed within 30 days following completion of				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		construction activities in waters of the U.S. b) For California project locations, shall comply with CWA Section 401 WQC Standard Conditions, and Additional Conditions (Pursuant to CCR Title 23, Section 3859(a)) of Lahontan Water Board Order No. R6T-2020-0032, as amended or superseded (California). c) For Nevada project locations, shall submit for CWA Section 401 WQC with NDEP and shall identify implementation of BMPs for avoidance and minimization of impacts to waters of the State, including sediment and erosion control measures, habitat preservation, project scheduling, flow diversions, dewatering, and hazardous materials management. For Nevada project locations, requiring NDEP Working in Waters notification, the Applicant shall submit a notice of intent (NOI) describing the project location, purpose and duration of the project, equipment(s) involved and how each will be operated, and BMPs to be implemented. d) Shall implement water quality protection measures required by CDFW LSA/SAA Agreement for Routine Maintenance (1600-2014-0082-R2, as amended or superseded). e) Additional project conditions and monitoring and reporting for AIP control by Hydraulic and Mechanical Dredging shall include: i) Monitoring and Reporting shall be conducted in compliance with the				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		Marina General Permit, where applicable. ii) Water Board staff must be notified a minimum of forty-eight hours prior to commencing dredging. iii) Turbidity curtains shall be used during implementation to effectively contain and isolate wastes from dredging and prevent turbidity from lakebed sediments outside the containment area. iv) In marinas where the Marina General Permit is applicable, the Applicant shall provide to the Water Board a report prior to project initiation, acceptable to the Executive Officer, which includes pre-dredging monitoring results, AIP survey results, and a utility avoidance plan. v) If a sediment plume is visible at any time outside of the turbidity curtain, the Applicant shall immediately cease dredging operations, measure the turbidity within the plume area, and implement measures to eliminate the discharge. The Applicant shall also delineate the size of the area by visually documenting the extent of the plume with photographs. Turbidity measurements may be taken with a hand-held field meter. The sample location and sample results shall be recorded in a logbook and emailed to the Water Board at Lahontan@waterboards.ca.gov				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		within 12 hours of taking the turbidity measurement. vi) Dredging operations shall immediately cease if inclement weather or wave and/or wind action threatens to cause suspended sediment discharges to spread turbidity beyond the curtained dredging area. The Applicant shall take immediate action to ensure that turbidity outside the curtained containment area is kept to a minimum at all times, even in adverse conditions, such as high winds, wave action or currents. vii) The turbidity curtain shall not be removed until Water Board staff verifies monitoring results demonstrating that the turbidity within the Project area do not exceed 3 NTU or the background turbidity levels, whichever is higher. viii) Excavators, if used, shall be steam cleaned prior to use. ix) Construction and mechanical equipment shall be monitored for leaks, and removed from service, if necessary, to protect water quality. Mechanical equipment that must be submersed in Lake Tahoe during the dredging operation shall be steam-cleaned and inspected for leaks prior to use. x) The use of chitosan or any flocculent to reduce turbidity in the lake is prohibited.				

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
Recreation	All Methods where Public Access is Affected/ Methods Used in Public Recreation Areas	**REC-1: Public Notice and Staging Safety** 1. Where control methods are implemented in public recreation areas, the entity with jurisdiction over the recreation area to be treated shall be notified by Tahoe RCD **or other project proponents implementing AIP control**. On National Forest Service lands, **the project proponents and/or** Tahoe RCD shall coordinate with the Forest Service permittee at the site where the control method is to be implemented. Coordination and scheduling shall occur in advance of the control activity to ensure there are no scheduling conflicts with planned events and to ensure appropriate onsite public safety actions are implemented. This includes coordination with the US Coast Guard during dredging operations. Permit requirements related to access and safety shall be implemented. 2. Where public access is limited during control activities, including in waterways, marinas, parking lots, and trails used to access control sites, signage shall be posted indicating what access limitations are occurring, the duration of the event, and a contact and phone number should the public have questions or need to report an incident. 3. In staging areas, signage and safety barriers shall be erected around materials and equipment to prevent public access and maintain safety. 4. To the extent feasible, AIP control activities that temporarily reduce public recreation access, shall be scheduled for	Tahoe RCD	Tahoe RCD, TRPA	Prior to and during control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		early morning and weekday periods to avoid heavier recreational activity hours.				
Transportation	Benthic Barriers and LFA and All Methods Used Within a Marina	**TRANS-1: Communication Coordination and Securing Barriers and Aeration Systems** 1. Bottom barriers and aeration systems shall be checked routinely to inspect and re-secure any treatment materials that move or start to billow or become unsecure. **<u>During project planning, scheduled maintenance visitation of barriers and aerations systems will be determined based on site specific characteristics (e.g., inspected at least monthly or more frequently based on site specific characteristics that affect equipment stability such as water depth, wave action, wind exposure, and amount of recreational access).</u>** 2. Prior to work within affected marinas, Tahoe RCD shall coordinate with the marina to secure access, coordinate and schedule activity that would be occurring in the area, and implement appropriate safety protocol required by the marina.	Tahoe RCD	Tahoe RCD, TRPA	Prior to and during control implementation	
Tribal Cultural Resources	Suction and Mechanical Dredging and All Methods That Disturb Substrate in Culturally Sensitive Areas	**TRIBAL-1: Tribal Cultural Resources Consultation** Prior to beginning AIP control methods that necessitate ground (i.e., bed substrate) disturbing activities within a culturally sensitive area, **<u>the project proponents and/or</u>** Tahoe RCD shall consult with the Washoe Tribe of Nevada and California Tribal Historic Preservation Officer and the USACE Cultural Resources Specialist or Forest Service Heritage Program Director, as dictated by	Tahoe RCD	Tahoe RCD, TRPA, LTBMU	Prior control implementation	

Resource Area	Applicable Control Method	Mitigation Measure or Resource Protection Measure	Implementing Entity	Monitoring and Reporting Entity(s)	Timing	Status
		control site location, to review recorded submerged resources and specific flagging distances necessary for avoidance and protection of Tribal cultural resources and Washoe heritage sites. If tribal cultural resources are discovered within the treatment area, **<u>the project proponent and/or</u>** Tahoe RCD will further consult with the Washoe Tribe of Nevada and California to protect and further avoid those resources.				
Utilities	All Methods Except Hand Removal and Surveillance within 0.25 Mile of a Water Intake	**UTILITY-1: Service Provider Notification** Prior to implementation of control methods within one-quarter mile of a water intake, excluding hand removal and surveillance monitoring, **<u>the project proponent and/or</u>** Tahoe RCD shall notify the Tahoe Water Suppliers Association and the affected water provider that owns the intake of the proposed control activity, duration, and daily timing. Intake protection, notification, or other measures and conditions required by the service provider to maintain their infrastructure and service levels shall be implemented. No control activities within one-quarter mile of an intake shall occur until coordination is conducted and intake protection measures, if needed, are in place.	Tahoe RCD	Tahoe RCD	Prior to applicable implementation activities within 0.25 mile of a water intake.	

Source: Hauge Brueck Associates 2020

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APPENDIX A: AIP CONTROL ACTION HISTORY, BACKGROUND, AND SUPPLEMENTAL DATA

HISTORY

Aquatic invasive plant (AIP) infestations have dramatically increased in Lake Tahoe in the past 15 years, and as infestations have grown, the array of response mechanisms and strategies has also increased. Previous efforts to control AIP populations have ranged from monitoring and tracking to aggressive efforts to directly remove these species. Different control actions and efforts have been used in various locations around Lake Tahoe and the Truckee River as various control strategies are developed. Over time, the efforts to control AIP have grown from localized actions to the development of management plans and action agendas. This discussion provides a history of these efforts.

From 2005 to 2009, a cooperative effort among management and regulatory agencies, scientists, and professional divers was initiated to combat the invasive aquatic plant infestation in Emerald Bay after the dramatic expansion was discovered in 2003. A series of small-scale control actions were deployed in Emerald Bay between 2005 and 2009, but the EWM infestation continued to persist. The recognition of persistence was documented by the California Department of Parks and Recreation (CDPR) through transect monitoring beginning in 2008. By the end of 2009, three separate patches of EWF had established at the western end of Emerald Bay, covering a combined area of over 3 acres. One small infestation of curly-leaf pondweed was detected in 2009 near Vikingsholm Pier; the infestation was immediately removed, and the species has since not been detected in Emerald Bay. Also in 2009, the cooperative effort tested available control methods at the Ski Run infestation area; however, a limited amount of work was conducted at the Ski Run site due to high recreational boater traffic and concern for the safety of project divers.

In 2010, CDPR and the Nearshore Aquatic Weed Working Group (NAWWG) sought to use a combination of control methods over a larger proportion of the Vikingsholm Pier site in Emerald Bay in a strategic attempt toward eventual complete removal of a discrete infestation. Although transect monitoring data collected prior to the 2010 efforts in Emerald Bay indicated that EWM will begin to re-colonize a site within 15 months following control activities, the pilot project in 2010 reduced the observed re-colonization rate by treating a greater portion of the infestation. Using the techniques and lessons learned in Emerald Bay, a comprehensive control strategy and removal techniques for Lake Tahoe was developing.

The NAWWG also identified an opportunity in 2010 to partner with the private operator of Lakeside Marina in a cooperative effort to dredge the marina bottom and remove aquatic vegetation. The Lakeside Marina dredging was an attempt to evaluate the effectiveness of standard maintenance dredging in removing aquatic plant populations. Approximately 8-12 inches of benthic material was removed, including aquatic weed biomass. However, rapid and nearly complete recovery of plants from 2010 to 2011 suggests that dredging alone, even with removal of the plant biomass, does not effectively eradicate the population.

From 2011 to 2013, Tahoe RCD, CDPR, and Tahoe Regional Planning Agency (TRPA) conducted comprehensive weed control and removal in Emerald Bay, Lakeside Marina, Lakeside beach, and the channels offshore from Ski Run Marina. In 2011, bottom-barriers and diver-assisted hand removal were used to remove or treat visible EWM at Parson’s Rock and Vikingsholm Pier/Swim Beach. In addition to these two comprehensive control methods, preliminary work was begun in a third area, Avalanche Beach. Synthetic bottom barriers were deployed from May to late October and divers assisted in substantial hand removal efforts from late September through late October. A total of 0.49 acres of lake bottom was treated with barriers in Emerald Bay and divers removed an approximate total of 22 cubic yards of plant material. The 2011 control actions removed submerged aquatic vegetation from greater than 99% of the infested areas at Parson's Rock and Vikingsholm Pier/Swim Beach. Plant density at the perimeters of the infestations was very low and the plants were very small. Diver-assisted hand removal at the Avalanche Beach infestation in 2011 was estimated to have removed 75-80% of the plants that were not covered by barriers.

In 2012, activity in Emerald Bay was primarily focused at Avalanche Beach because the infestations at the other two sites were significantly reduced as a result of the highly successful control actions in 2011. The Vikingsholm Pier/Swim Beach infestation was nearly eradicated, with only a very small number of new plants observed. These plants were removed and follow-up monitoring and maintenance continued in 2013. Upon removing barriers from Parson's Rock in the spring of 2012, a relatively small amount of diver-assisted removal was needed there (approximately 8,700 square feet) to remove EWM. Comprehensive treatment was repeated at Parson's Rock in 2013 and post-implementation monitoring showed the infestation is virtually eradicated, with only maintenance needed in 2014.

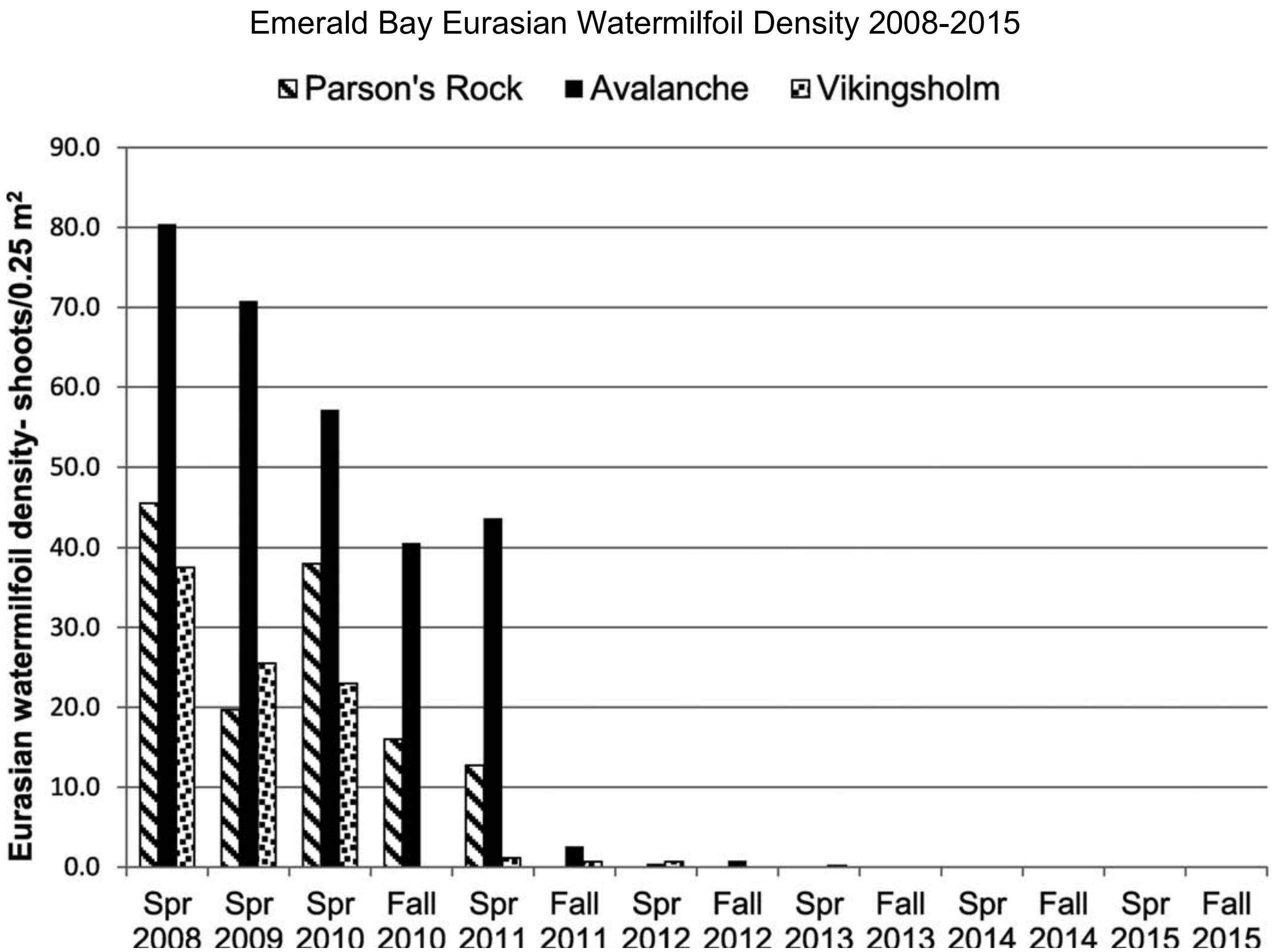
Avalanche Beach presented a more difficult invasive aquatic plant control environment than either Vikingsholm Pier/Swim Beach or Parson's Rock due to the physical environment. The substrate is largely covered in woody debris of varying sizes from historic avalanches and landslides that makes the placement of barriers very difficult. Additionally, EWM was observed growing at Avalanche Beach in shallow areas that are difficult to access with watercraft and equipment. To address these challenges, contract divers have improved their barrier deployment and diver-assisted suction removal techniques and were able to deploy approximately 1.01 acres of barrier material at Avalanche Beach in 2012. An additional 1.88 acres was treated using diver-assisted suction removal. This infestation had increased in size from 2011 to 2012 by nearly 25% and remained approximately 30% untreated after 2012. Comprehensive control methods were repeated at this location in 2013, when divers deployed 66 acres of barriers and hand-removed plants from an additional 18 acres of lake bed. Post implementation monitoring showed no submerged aquatic plants at this site in fall 2013. The CDPR will continue maintenance and monitoring at Avalanche Beach and throughout Emerald Bay in 2014.

As described above, aquatic invasive plants were mechanically dredged from Lakeside Marina in 2010 but the weeds had completely recolonized the marina in 2011. In 2012, Tahoe RCD and TRPA partnered to treat the entire marina using bottom-barriers and diver assisted hand removal. Surveys in 2013 showed that the submerged aquatic vegetation was significantly reduced from 2012 and the majority of growth observed was a native plant species; however, CLP was observed growing in three discrete areas within the marina.

Also in 2012 and 2013, Tahoe RCD and TRPA, with contributions from Lakeside Homeowners Association, conducted the first comprehensive treatments for EWM and CLP in Lake Tahoe's nearshore at Lakeside Beach and Ski Run channels. Contract divers used multiple watercraft, swim markers and buoy lines, and limited work hours to avoid potential safety or navigation issues in high traffic boating areas. Utilizing techniques from Emerald Bay together with commercial diving expertise, the team was able to accomplish a large capacity of plant removal in areas that were previously thought to be infeasible. Barrier deployment and diver-assisted removal treated 1.5 acres at Lakeside Beach in 2012 and 1.67 acres in 2013. Removal efforts at Ski Run treated 3.15 acres in 2012 and 3.10 acres in 2013. Post-control implementation monitoring has shown that the infestations at both sites have been significantly reduced from pre-implementation conditions.

The AIP control efforts and subsequent monitoring from 2010 to 2013 have provided the data to demonstrate year-to-year effectiveness in aquatic plant control, along with information on cost, timing, control methods, re-colonization rates, and logistical knowledge. With the existing infrastructure that is provided by the partners in the Lake Tahoe Aquatic Invasive Species Program and with adequate and predictable funding, effective control of infestations in Lake Tahoe and the Truckee riverine system can significantly reduce the EWM and CLP infestations, as depicted by declining density results presented in Figure A-1.

Figure A-1



Source: Shaw, Hymanson an Sasaki, 2016

Between 2014 and 2015, the drought resulted in low water levels, which allowed for easier access and implementation of control methods. During this time, benthic barriers were installed below the dam on the Truckee River. In 2015, benthic barriers were installed and left in place for a year with monitoring at the Crystal Shores East Marina.

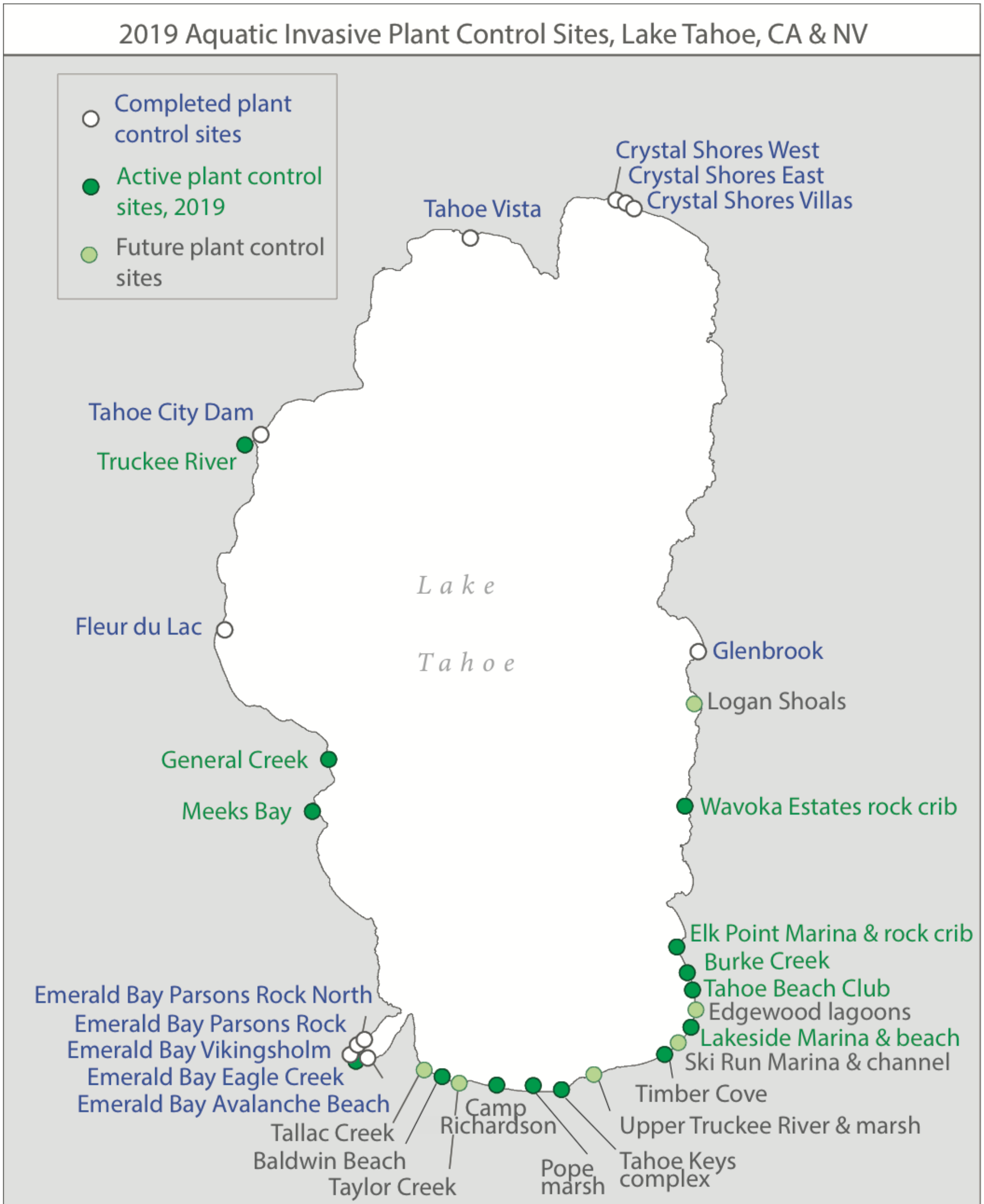
The 2015 Implementation Plan for the Control of Aquatic Invasive Species within Lake Tahoe identified priority locations for plant control due to presence of invasive plant species and non-native warm water target invasive fish. The 2015 Plan identified 22 known and historic sites with aquatic invasive plant presence, excluding the Tahoe Keys. In 2015, control methods were used at the Fleur du Lac Marina, Lakeside Marina, Lakeside Beach, Crystal Shores, Tahoe Keys East and West Channels, and attempted at Ski Run Marina.

Various methods were implemented along the Truckee River from the Tahoe City Dam to the walking bridge downstream from 2014 to 2017. Methods used from 2014 to 2015 included benthic barriers, hand pulling/removal, and diver-assisted suction removal methods in Reach 1 (Lake Tahoe Dam to the sill of Lake Tahoe) and Reach 2 (Lake Tahoe Dam downstream to the historic dam) on the Truckee River. In 2016, Tahoe RCD contracted UC Davis Tahoe Environmental Research Center (TERC) to monitor the previous years' control efforts, and additional treatment occurred on Reach 3 (historic Lake Tahoe Dam to the pedestrian footbridge). In 2017-2019, Reaches 1 through 3 were treated using diver assisted hand pulling and suction methods.

Other locations that received treatment in 2016 Lakeside Beach and Marina, and the Fleur du Lac Marina. In 2017, benthic barriers were installed at the Tahoe Vista boat launch, and in 2018, plant control projects occurred in 11 locations. Surveillance monitoring occurred at three locations in Crystal Shores marinas, Emerald Bay, Fleur du Lac Marina, above the Tahoe City Dam, and at the Tahoe Vista boat launch. Active control occurred at Elk Point Marina, Lakeside Beach, Lakeside Marina, and below dam on the Truckee River. Planning areas were established for Meeks Bay Marina, Ski Run Channel/Marina, Taylor Creek, Tallac Creek, and the Upper Truckee River. Other areas treated in 2017 and 2018 include Glenbrook Bay South.

From 2017 forward, several previously infested locations were free of aquatic invasive plants and entered into a phase of surveillance monitoring. These sites include Crystal Shore West, Crystal Shores East, and Crystal Shores Villas, Tahoe Vista Boat Launch, Tahoe City Dam, Fleur du Lac Outer and Inner Harbors.

Historic efforts to control AIP are summarized in Table A-1, with key locations depicted in Figure A-2. Figure A-2 depicts control sites that were active in 2019, and includes reference to other future and historic sites not treated in 2019 based on known AIP populations and the Action Agenda. “Completed” sites are still subject to periodic monitoring to determine if AIP populations have returned. New control sites within the project area could be identified if infestations are detected, and these control sites and the implementation of control methods could occur anywhere within the entire project area. Table A-1 lists AIP infestation locations, size, the actions taken, and the Action Agenda ranking for the location. The Action Agenda categorizes sites as Tier 1 (high priority from subcategory A to C), Tier II (secondary priority), and EDRR/Surveillance (Early Detection Rapid Response/Surveillance). Table A-2 lists sites where maintenance dredging has previously occurred. Maintenance dredging has resulted in removing AIP along with targeted sediment buildup and is an indirect control action. Future maintenance dredging may be coordinated with AIP removal efforts, although the extent of maintenance dredging with AIP removal would be limited only to areas previously dredged. Maintenance dredging would not be a control action implemented solely for the removal of AIP, but AIP removal may be coordinated with otherwise planned navigational maintenance dredging. This figure and these tables provide a summary reference of past actions, where future activity may also occur.



Completed plant control sites indicate areas where a control project has been implemented and subsequent surveillance surveys have found little or no reestablishment. If plants reestabish to a degree that can not be treated during a surveillance survey, the status will be updated. *Active plant control sites* indicate an infestation that is currently funded for treatment. *Future plant control sites* indicate an infestation that has not currently been funded for treatment. Map created by Tahoe RCD, April 2019. NAD 1983 UTM Zone 10N, Transverse Mercator.

Source: Tahoe RCD 2019

Figure A-2. Aquatic Invasive Plant Control Sites

Table A-1

Aquatic Invasive Plant Infestation Locations, Size and History

Infestation Location	Pre-treatment/Current estimated area (acres)	Location History	Action Agenda Priority
*Crystal Shores West (NV)	0.5/0	Historic infestation site. Surveillance occurred from 2017-2019. < 5 plants detected and hand-pulled.	EDRR/Surveillance
*Crystal Shores East (NV)	0.5/0	Historic infestation site. Benthic barriers were applied in 2014 (0.24 acre), 2015 (0.4 acre) and 2016 (0.4 acre). Surveillance occurred from 2017-2019. < 5 plants detected and hand-pulled.	EDRR/Surveillance
*Crystal Shores Villas (NV)	~0.5/0	Historic infestation site. Surveillance and hand removal (<5 plants) occurred in 2016 and surveillance occurred again in 2018-2019. No plants detected.	EDRR/Surveillance
*Wovoka Estates (NV)	0.1/0	Current infestation site. Barriers were installed in late Summer 2019 and removed in Fall 2019. Control work/surveillance will continue in 2020.	Tier 2
Timber Cove Pier (CA)	~0.25/0	Surveyed in 2012 and 2018 Plants removed in 2019.	Tier 1 C
Beach between Ski Run and Lakeview Lodge (CA)	UNK	Historic infestation site.	Historic
*Ski Run Channel and Marina (CA)	~4/3.5	Current infestation site. Unspecified treatment occurred in 2009. Benthic barriers and diver-assisted suction removal used in 2011 and 2012 on 3.13 acres. Benthic barriers, and diver-assisted suction removal used in 2013 (50% reduction). LFA system installed in 2018. Few to no plants detected in 2019 survey.	Tier 1 B
El Dorado Beach/Lakeview Commons (CA)	UNK	Historic infestation site	Historic
Commons Beach, Tahoe City (CA)	UNK	Historic infestation site. Surveyed in 2012.	Historic
*Tahoe City Marina/ Boatworks (CA)	UNK	Historic infestation site. Surveyed in 2018, no plants detected.	Historic
Tahoe City Dam (CA)	0.6/<0.1	Current infestation site. Treated with hand removal in 2009. Surveyed in 2010 and 2011 (no plants observed). Observed increase from 2011 to 2013. Treated with benthic barriers in 2014 (0.42 acre). Hand removal and diver-assisted suction removal were used in 2016, and used in 2017 on 0.55 acres. Surveillance in 2018-2019 with some plants observed and removed.	EDRR/Surveillance
Lower Truckee River below Tahoe City Dam (CA)	20/17	Current infestation site. Hand removal conducted by volunteers occurred in 2013. Diver-assisted suction removal was used in 2014 on 0.15 acre. Benthic barriers used in 2015 (0.28 acre). Benthic barriers and diver-assisted suction removal were used to	Tier 2

Infestation Location	Pre-treatment/Current estimated area (acres)	Location History	Action Agenda Priority
		treat 1.66 acres in 2016. Diver-assisted suction removal was used in 2017 on Reach 1, 2, 3 and in 2018 and 2019 work continued downstream of the pedestrian bridge	
Tahoe Tavern (North, South) (CA)	UNK	Historic infestation site. Surveyed in 2012 and 2018 No plants detected.	EDRR/Surveillance
*Obexer's Marina (CA)	UNK/<0.25	Historic infestation site. Surveyed in 2012 and 2018. EWM detected in 2018.	EDRR/Surveillance
*Fleur du Lac Marina (CA)	0.5/0	Historic infestation site. Mechanical maintenance dredging occurred in 2015, over a 24,710 square-foot area, which removed AIP along with sediment. Benthic Barriers and diver-assisted suction removal occurred in 2016. Benthic barriers and hand pulling again used in 2017 and surveillance occurred in 2018 and 2019 (no plants observed).	EDRR/Surveillance
Sunnyside Marina (CA)	UNK/<0.25	Historic infestation site. Unspecified treatment occurred in 2008 (hand removal). Eurasian watermilfoil detected in December 2019 and all plants were hand-pulled.	EDRR/Surveillance
*Lakeside Marina (CA)	3/1	Current infestation site. Mechanically dredged in 2009 using a clamshell on a ramp and benthic barriers (0.92 acre). Diver-assisted suction removal in 2012. Estimate 75% reduction. Continued monitoring in 2014. Benthic barriers applied to 1.99 acres in 2015. Hand removal, hand suction, and benthic barriers applied in 2016. Benthic barriers and UVC light applied in 2017, and benthic barriers applied again in 2018 and 2019 on 0.82 acre.	Tier 1 B
Lakeside Beach (CA)	1.5/0.5	Current control site. Benthic barriers and hand suction were used in 2012 (1.85 acre), 2013 (1.67 acres), and 2015 (1.99 acres). Benthic barriers were used again in 2016, while in 2017 hand suction and UVC light methods were used. Diver-assisted suction removal occurred again in 2018. UVC light with a skimmer was also used in 2019.	Tier 1 B
Beach between Ski Run and Lakeside Marina (CA)	UNK	Historic infestation site.	Historic
Lake Forest Boat Ramp (CA)	UNK	Unidentified treatment prior to 2014.	Historic
*Star Harbor Marina (CA)	UNK/0	Anecdotal detection of Eurasian watermilfoil. Surveyed and no plants detected in 2017.	EDRR/Surveillance
Edgewood Creek and Pond Complex (NV)	UNK/~10	Current infestation site. Surveyed in 2012 and 2018.	Tier 1 B
Nevada Beach (NV)	UNK	Historic infestation site. Small patches were observed in 2012 and 2013.	Tier 2
Burke Creek (NV)	0.1/0	Current infestation site. Hand removal occurred in 2018 and 2019.	Tier 2
Tahoe Beach Club Creek (NV)	0.3/0	Current infestation site. Hand removal occurred in 2018 and 2019.	Tier 2

Infestation Location	Pre-treatment/Current estimated area (acres)	Location History	Action Agenda Priority
*Elk Point Marina/Crib Wall (NV)	0.5/0	Current infestation site. Curly-leaf pondweed was hand-pulled in 2017. Benthic barriers were used in 2018 and 2019. Follow-up treatment is planned for 2020.	Tier 1 C
Elk Point and Round Hill Shoreline structures (NV)	~3/0	Active treatment occurred in 2019	Tier 2
Zephyr Cove Marina (NV)	UNK	Historic infestation site. Surveyed in 2012.	EDRR/Surveillance
Zephyr Point (NV)	UNK	Historic infestation site.	Historic
*Logan Shoals / Bluth Marina (NV)	1.75/1.75	Current infestation site. Surveyed in 2012.	Tier 2
Glenbrook (NV)	0.1/0	Historic infestation site. Surveyed in 2012. Hand removal occurred in 2016 and 2017. Surveillance in 2018 detected one Eurasian watermilfoil plant.	EDRR/Surveillance
Meeks Bay Marina (CA)	2/2	Current infestation site. In 2019, 2 acres were treated through hand removal and skimming, diver-assisted suction removal, and benthic barriers. Benthic barriers were placed in the marina and channel up to Highway 89 and most of the barriers will be left in place over winter.	Tier 1 A
Meeks Creek (CA)	3/3	Active treatment in 2019	Tier 1 A
General Creek (CA)	.1/0	Current infestation site. Hand removal occurred in 2018, and surveillance monitoring in 2019.	Tier 2
Tahoe Vista Boat Launch (CA)	0.2/0	Historic infestation site. Treated in 2017 with benthic barriers and surveillance monitoring occurred in 2018 and 2019.	EDRR/Surveillance
Taylor Creek (mouth) (CA)	12/12	Partially treated in 2010/2011 with hand removal; Comprehensive control in 2013. Hand removal occurred in 2014 and additional control in 2015. USFS monitoring (2019) indicates a 12-acre infestation has formed.	Tier 1 A
Tallac Creek (mouth) (CA)	1.25/1.25	Current infestation site. Comprehensive control in 2013 with hand removal. USFS monitoring (2019) indicates a 1.25-acre infestation has formed.	Tier 1 A
Camp Richardson (CA)	0.25/0	Current infestation site. Survey in 2012; Patches of native plants observed in 2013. Hand removal occurred in 2019.	Tier 1 C
Baldwin Beach (CA)	0.25/0	Current infestation site. Hand removal occurred in 2019.	Tier 1 C
*Tahoe Keys Channels and Main Lagoon (CA)	172/172	Current infestation site. A bubble curtain is in place in the west channel, and a double bubble curtain is planned for the East Channel in 2020.	Tier 1 A
Pope Marsh (CA)	<1/<1	Current infestation site. Hand removal occurred in 2019.	Tier 1 A
Regan Beach (CA)	0.1/0.1	Historic infestation site. Untreated. Surveyed in 2012. Planned for treatment in 2020.	Tier 2
Secret Beach (NV)	UNK	Historic infestation site.	Historic
Upper Truckee River and Marsh (CA)	1.25/1.25	Current infestation site.	Tier 1 A

Infestation Location	Pre-treatment/Current estimated area (acres)	Location History	Action Agenda Priority
Whale Beach (NV)	<0.1/0	Historic infestation site. A single plant was removed by hand in 2016.	Historic
Emerald Bay, Parson's Rock (CA)	~1/0	Historic infestation site. Benthic barriers installed in 2008 (0.01 acre) and 2009 (0.23 acre). Hand suction used in 2010 (0.05 acre). Benthic barriers and hand suction used in 2011 (0.94 acre). Hand suction was used again in 2012 (0.2 acre), 2013 (0.84 acre), and 2014 (0.01 acre). Surveillance occurred from 2015 to 2018 (no plants observed).	EDRR/Surveillance
Emerald Bay, Parson's Rock North (CA)	<.2/0	Historic infestation site. Hand suction used in 2013 (0.025 acre) and 2014 (0.01 acre). Surveillance occurred from 2015 to 2018 (no plants observed).	EDRR/Surveillance
Emerald Bay, Vikingsholm Pier/Swim Beach (CA)	2.25/0	Historic infestation site. Hand suction occurred in 2009 (0.08 acre). Benthic barriers and hand suction used in 2010 (0.29 acre). Benthic barriers installed in 2011 (2.24 acres). Hand suction occurred in 2012 (0.04 acre) and 2013 (0.72 acre). Surveillance occurred each year from 2015-2018 (no plants observed).	EDRR/Surveillance
Emerald Bay, Avalanche Beach (CA)	3.3/0	Historic infestation site. Treated in 2005 (0.5 acre) and 2006 (0.28 acre) with hand suction. Benthic barriers applied to 0.01 acre in 2009. Benthic barriers and hand suction used in 2011 (1.12 acres), 2012 (2.89 acres), and 2013 (3.33 acres). Surveillance occurred in 2015, 2016, 2017, and 2018 (no plants observed).	EDRR/Surveillance
Emerald Bay, Eagle Creek (mouth) (CA)	0.3/0	Current infestation site. Treated in 2013 with hand suction on 0.32 acre. Surveillance occurred in 2015 through 2017 (no plants observed). Hand removal of 50 to 60 pants occurred in 2018.	EDRR/Surveillance
Total	**237.75/226.95**		

Source: Tahoe RCD, TRPA, CDPR

Notes:

This table serves as a status at the time of this IS/IEC/EA.

Entries with an asterisk "*" indicates locations where dredging has been permitted in the past. These locations could be considered for future AIP control using dredging. Table A-2 provides additional information on the dredging that has occurred to date.

Action Agenda Priorities are categorized as follows:

Tier 1 locations - these locations are the highest priority based on their location at the upper portion of the Tahoe watershed, the size of the AIS infestation, their connectivity to one another, and the existence of other associated AIS (e.g. invasive fish), the projected extent of ecosystem benefits to be achieved (e.g. multiple benefits), and the perceived high risk to ecological integrity. Tier 1 locations are subdivided into three categories: ranging from A (highest priority) to C (lowest priority).

Tier 2 locations - these locations are secondary priorities primarily because of the smaller size of the infestation relative to Tier 1 locations. In addition, these locations are not located on the south shore of Lake Tahoe, and are not as well connected to other infested sites.

Early Detection Rapid Response (EDRR)/Surveillance locations - these locations are sites that have either been treated and/or are under surveillance because of past infestation, or because of the likelihood of future infestation given the parameters of the site (high boater recreational use, proximity to infested locations, etc.). Monitoring these sites on an annual basis to assess the status of any AIS infestation is critical. EDRR funds should be dedicated and used on an annual basis to control documented infestations at these locations and any new locations in the region.

Historic – these locations are not listed by the Lake Tahoe Region Aquatic Invasive Species Action Agenda, but where locations of historic infestation and are no longer considered active.

Table A-2

Past Lake Tahoe Dredging Locations and History

Dredging Location	Summary of Past Control Methods
Crystal Shores West	Mechanically dredged in 2012 with an excavator on a barge.
Crystal Shores East	Mechanically dredged with an excavator in 1993, mechanically dredged in 2010, and in 2013.
Crystal Shores Villas	Mechanically dredged with an excavator on a barge/on beach in 2015.
Wovoka Estates	Unspecified dredging occurred in 2013 at the boathouse and breakwater.
Ski Run Channel and Marina(CA)	Mechanically dredged in 2015 (250 cubic yards of channel maintenance dredging) via a clamshell excavator on a barge.
Tahoe City Marina/ Boatworks	Mechanically dredged 253 cubic yards of material in 2013. Mechanically dredged 253 cubic yards in 2014 (maintenance dredging of 15,080 square feet). The marina was mechanically dredged with a clamshell on a barge in 2015 (1,439 cubic yards).
Obexer's Marina	Approximately 200 cubic yards were dredged at the marina in 2014 using a mechanical excavator on a barge (approximately 17,000 square feet excavated).
Homewood Marina	Mechanically dredged from 2015-2016 using an excavator on a barge (approximately 535 cubic yards dredged)
Fleur du Lac Marina	Mechanically dredged in 2015 using an excavator on a barge. Approximately 2,150 cubic yards over 24,710 square feet were dredged
Meeks Bay Marina	Mechanically maintenance dredged 350 cubic yards in 2014 (approximately 4,000 square foot area)
Lakeside Marina	Mechanically dredged in 2009 using a clamshell on a ramp, and in 2015 with a long-reach excavator
Star Harbor Marina	Approximately 628 cubic yards were mechanically dredged in 2015 using an excavator on a barge.
Elk Point Marina/Crib Wall	Partially treated in 2010 (mechanical dredging with excavator on barge and hand removal). 307 cubic yards were removed that blocked the marina entrance, with Eurasian watermilfoil removal. Maintenance dredging occurred again in 2014 and 2017 and included AIP removal.
Logan Shoals / Bluth Marina	Eurasian watermilfoil removed during routine mechanical dredging in 2010
Tahoe Keys Channels and Main Lagoon	Suction dredging with a horizontal cutter occurred in 1992 (east channel) and 1993 (west channel). Suction dredging occurred again in the 2000s. Mechanical dredging of the east and west channels occurred in 2015 using an excavator on a barge with beach replenishment, 9,800 cubic yards of material dredged.

Source: Tahoe RCD, TRPA, CDPR

Notes:

This table serves as a list of historic dredging sites where future dredging may be permitted under TRPA and Lahontan Codes. Locations not previously authorized for dredging cannot be considered for dredging as a potential AIP control measure.

BACKGROUND

Potential impacts are defined for Table A-3 as follows, noting that the analysis did not identify potentially significant or cumulatively adverse impacts. Table A-3 was prepared throughout review of AIP background documents, reports and studies, and published scientific studies and is presented in support of the following analyses of potential water quality impacts of each AIP control method.

Table A-3: Potential Effects to Beneficial Uses and Water Quality Objectives

California Beneficial Uses and Basin Plan Chapter 5 Narrative and Numeric WQOs	SURVEILLANCE MONITORING	HAND PULLING/ REMOVAL	HAND SUCTION REMOVAL	BENTHIC BARRIERS	LFA	UV-C LIGHT	SUCTION DREDGING	MECHANICAL DREDGING
BIOL - Preservation of Biological Habitats of Special Significance. Beneficial uses of waters that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, and Areas of Special Biological Significance (ASBS), where the preservation and enhancement of natural resources requires special protection.	B	NI	T	T	T	T	T	T
COLD - Cold Freshwater Habitat. Beneficial uses of waters that support cold water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.	B	NI	T, B	T, B	T, B	T, B	T	T
COMM - Commercial and Sportfishing. Beneficial uses of waters used for commercial or recreational collection of fish or other organisms including, but not limited to, uses involving organisms intended for human consumption.	NI	NI	T	T	NI	NI	T	T
FLD - Flood Peak Attenuation/Flood Water Storage. Beneficial uses of riparian wetlands in flood plain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.	NI	NI	NI	NI	NI	NI	NI	NI
MIGR - Migration of Aquatic Organisms. Beneficial uses of waters that support habitats necessary for migration, acclimatization between fresh and salt water, or temporary activities by aquatic organisms, such as anadromous fish.	NI	NI	NI	T	NI	NI	T	T
MUN - Municipal and Domestic Supply. Beneficial uses of waters used for community, military, or individual water supply systems including, but not limited to, drinking water supply.	NI	NI	T, B	T, B	B	B	T	T
NAV - Navigation. Beneficial uses of waters used for shipping, travel, or other transportation by private, military, or commercial vessels.	NI	NI	T	T	NI	T	T	T
RARE - Rare, Threatened, or Endangered Species. Beneficial uses of waters that support habitat necessary for the survival and successful maintenance of plant or animal species established under state and/or federal law as rare, threatened or endangered.	B	B	B	B	B	B	Not Permitted	Not Permitted

Table A-3: Potential Effects to Beneficial Uses and Water Quality Objectives

California Beneficial Uses and Basin Plan Chapter 5 Narrative and Numeric WQOs	SURVEILLANCE MONITORING	HAND PULLING/ REMOVAL	HAND SUCTION REMOVAL	BENTHIC BARRIERS	LFA	UV-C LIGHT	SUCTION DREDGING	MECHANICAL DREDGING
REC-1 - Water Contact Recreation. Beneficial uses of waters used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs.	B	B	T, B	T, B	B	B	T	T
REC-2 Non-contact Water Recreation. Beneficial uses of waters used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.	NI	NI	T	T	NI	T	T	T
SPWN - Spawning, Reproduction, and Development. Beneficial uses of waters that support high quality aquatic habitat necessary for reproduction and early development of fish and wildlife.	NI	NI	T	T	NI	T	Not Permitted	Not Permitted
WARM - Warm Freshwater Habitat. Beneficial uses of waters that support warm water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.	NI	NI	T	T	B	T	T	T
WILD - Wildlife Habitat. Beneficial uses of waters that support wildlife habitats including, but not limited to, the preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl.	NI	NI	T	T	B	T	Not Permitted	Not Permitted
WQE - Water Quality Enhancement. Beneficial uses of waters that support natural enhancement or improvement of water quality in or downstream of a water body including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, streambank stabilization, maintenance of channel integrity, and siltation control.	NI	NI	NI	NI	NI	NI	Not Permitted	Not Permitted
WQ - Turbidity	NI	NI	T, LTS	T, LTS	B	T, LTS	T, LTS	T, LTS
WQ - Dissolved Solids	NI	NI	NI	T, LTS	B	T, LTS	T, LTS	T, LTS
WQ - Metals	NI	NI	NI	NI	B	NI	T	T
WQ - Dissolved Oxygen (percent of Saturation - 10% reduction)	NI	NI	NI	T, LTS	B	NI	NI	T
WQ - pH (6.5-8.5)	NI	NI	NI	NI	B	NI	NI	NI
WQ - Floating Material	NI	NI	NI	NI	B	NI	NI	NI

Table A-3: Potential Effects to Beneficial Uses and Water Quality Objectives

California Beneficial Uses and Basin Plan Chapter 5 Narrative and Numeric WQOs	SURVEILLANCE MONITORING	HAND PULLING/ REMOVAL	HAND SUCTION REMOVAL	BENTHIC BARRIERS	LFA	UV-C LIGHT	SUCTION DREDGING	MECHANICAL DREDGING
WQ - Oil and Grease	NI	NI	NI	NI	NI	NI	T	T
WQ - Nondegradation of Aquatic Communities and Populations	B	B	B	T, B	B	T, LTS	T, LTS	T, LTS
WQ - Radioactivity	NI	NI	NI	NI	NI	NI	NI	NI
WQ - Sediment	NI	T	T	T	B	NI	T	T
WQ - Settleable Materials	NI	T	T	T	B	NI	T	T
WQ - Suspended Materials	NI	T	T	T	B	NI	T	T
WQ - Suspended Sediment	NI	T	T	T	B	NI	T	T
WQ - Taste and Odor	NI	NI	NI	NI	B	NI	NI	NI
WQ - Temperature	NI	NI	NI	NI	NI	NI	NI	NI
WQ - Toxicity	NI	NI	NI	NI	DI	NI	T	T
Table 5.1-3 TDS (60/65 mg/L)	NI	NI	NI	T	B	T	NI	NI
Table 5.1-3 Cl (3.0/4.0 mg/L)	NI	NI	NI	NI	NI	NI	DI	DI
Table 5.1-3 SO4 (1.0/3.0 mg/L)	NI	NI	NI	NI	NI	NI	DI	DI
Table 5.1-3 B (0.01 mg/L)	NI	NI	NI	NI	NI	NI	DI	DI
Table 5.1-3 N (0.15 mg/L)	NI	NI	NI	T	B	T	T	T
Table 5.1-3 P (0.008 mg/L)	NI	NI	NI	T	B	T	T	T
Table 5.1-3 Fe (--)	NI	NI	NI	NI	NI	NI	NI	NI
USE - Recreation	NI	NI	T	T	NI	T	T	T
USE - Access	NI	NI	T	T	NI	T	T	T
BIO - BMI	NI	NI	T	T	B	T	T	T
BIO - Plankton	NI	NI	T	T	B	T	T	T
BIO - Algae	NI	NI	T	T	B	T	T	T
BIO - CHL-a	NI	NI	T	T	B	T	T	T
Cold Water Fisheries	B	B	B	T, B	B	B	T	T
Habitat Quality/Native Species	B	B	B	T, B	B	T, B	T	T

Notes:

NI No Impact	T Temporary Impact	B Cumulatively Beneficial Impact	DI Data Insufficient
LTS Less than Significant Impact	S Potential Significant Impact	C Cumulatively Adverse Impact	

SUPPLEMENTAL DATA

Summary of Findings of the Tahoe Dredge Study (TERC 1996) pertaining to potential impacts to water quality:

The UC Davis Tahoe Research Group (TERC) prepared final reporting for *Impacts of Marina Dredging on Lake Tahoe Water Quality* in 1996, which is the most comprehensive study of environmental impacts to the Lake Tahoe water body from dredging actions and is commonly referred to as the Tahoe Dredge Study. This final reporting analyzed historical dredging data for the period of record from 1988 to 1992 to assess potential water quality impacts from marina and harbor dredging and presented recommendations for physical and mechanical measures, operational control measures and monitoring measures, as based on the summary of findings. The dredge sites studied were Tahoe Keys Marina, TKPOA Lagoons, Crystal Shores East and Fleur Du Lac. The goals of the study included:

1. Evaluate the impact of different dredges and dredging procedures on lake water quality. Specifically, how much bottom disturbance is associated with different types of dredges and how does this disturbance contribute nutrients to the lake.
2. Determine concentrations of both soluble and particulate nutrients within selected marina sediments, then: (a) relate these concentrations to measured water concentrations during actual dredging operations; (b) determine to what extent these nutrients are bioavailable, and the impact of the dredged sediments on Lake Tahoe algal growth; (c) evaluate the potential water quality impacts of newly exposed, deeper sediments following dredging.
3. Study effectiveness and potential impacts of spoils dewatering and disposal methods in use.

Findings of the Tahoe Dredge Study (TERC 1996) pertaining to potential impacts to water quality provide agencies with information related to dredging policies.

- Considerable variability may exist in the nutrient content of sediments.
- Raw sediment TN or TP content was not a good predictor of the level of soluble or TN or TP release, as simulated in elutriate tests.
- A significant portion of TN released to the water column during dredging will often be organic nitrogen; however, inorganic nitrogen, which is readily available to algae (and AIP) composed a significant portion of the TN released from sediments analyzed.
- Based on elutriate tests, Biologically Available Phosphorus (BAP) release during dredging is extrapolated to approximately 1-6 percent of TP resuspended in the water column.
- Horizontal cutter hydraulic suction dredging produces surface plumes detectable 25 to 200 feet from the dredger with highest levels of turbidity and nutrients in plumes localized within 1- to 20 feet of the dredger.
- Mechanical dredging methods (excavator, clamshell and dragline) have relatively high sediment resuspension characteristics within containment areas of turbidity/silt curtains.
- The range of TN and TP loading to the lake body, from release of dredge water upon removal or failure of turbidity/silt curtains, hydraulic suction dredge plumes or spoil water return to the lake from hydraulic suction dredge spoil impoundment basins, estimated from less than one (1) kilogram levels to tens of kilogram levels and were comparable to other anthropogenic inputs to Lake Tahoe. For example, resuspension of five (5) kilograms of TN and TP during dredging is roughly equivalent to the annual TN and TP load in urban runoff from five (5) acres of moderately developed residential areas or two to three (2-3) acres of tourist-commercial development.
- Three (3) spoil settling (i.e., impoundment) basins employed for TKPOA dredging in 1992 were unable to consistently provide turbidity reduction and nutrient removal to achieve discharge standard limits at inflow rates of 1000 gallons per minute during 7-8 hours of operations per day. The addition of alum polymer flocculent to spoil waters discharged to impoundment basins in 1993 were effective in reducing turbidity

and nutrients (i.e., NH4-N, TRP, TP, TKN and TN) levels such that discharge standards were more consistently attained.

- Turbidity was found to be statistically associated with the levels of total or biologically available iron and TP resuspended during dredging.
- TN was not well correlated with Turbidity.
- Further evaluation of the discharge standard for iron was recommended. The linear relationship between turbidity and Total Iron found in the study predicted that the Total Iron discharge standard of 500 milligrams/Liter would be exceeded when turbidity exceeded 3.7 NTU. The discharge standard for turbidity is 20 NTU, however. Projects in compliance with the 20 NTU standard may exceed the discharge standard for Total Iron.
- Pre-dredging analysis of levels of heavy metals, Total Petroleum Hydrocarbons (TPH) and other potentially toxic substances in marina sediments, as well as the potential to be mobilized, should be conducted in order to direct decisions on the most appropriate method and location for spoil disposal. Where levels of toxic substances are high, spoil disposal should occur outside the Lake Tahoe Basin.
- Phytoplankton were typically co-limited by nitrogen and phosphorus concentrations. More specifically additions of DIN and BAP on the order of tenths of micrograms/Liter can potentially lead to short-term, localized areas of increased phytoplankton growth within spoil containment areas.
- Sampling of sediment interstitial water prior to and following hydraulic suction dredging at a site in the Tahoe Keys indicated that N03-N and NH4-N were released from the newly exposed sediments during dredging and/or in the 16 days following dredging; 0.39 kg NH4-N/acre dredged and 0.087 kg N03-N/acre dredged were estimated to have been released from the newly exposed sediments.
- Dredging may increase the potential for release of Nt4-N from the sediments over a long period. Interstitial NH4-N concentrations increased in the upper layers of newly exposed sediments at Tahoe Keys during the year following dredging. This increase may have been the result of microbial degradation (ammonification) of available organic matter. The proximity of this NH4-N to the surface sediments suggested release to the overlying lake water could potentially occur through physical disruption of the sediments and/or possibly through diffusion. Further study was recommended required to determine the magnitude of such release.
- The selection of an appropriate dredging method should consider the physical and chemical characteristics of bed substrate to be dredged, site characteristics, ability to use containment curtains to isolate the dredge areas, amount of material to be dredged, cost constraints and type of dredging equipment available.
- Spoils dewatering on land within a turbidity curtain containment area is preferable to dewatering along the shoreline adjacent to the lake water body, with dewatering within the containment area providing for more complete removal or resettling of bed substrates.
- Mechanical dredges (i.e., clamshell, dragline, excavator and backhoe) can effectively remove a variety of sediment types effectively and produce spoils that are similar in water content and density to the original bed sediment, but have high sediment resuspension characteristics and should only be sued within containment curtains.
- Cable Arm Clamshell produces sediment resuspension that is about 1/3rd of that of conventional buckets and may have applications in larger marina and harbor areas that contain more fine grain sediments.
- Hydraulic suction dredges (i.e., suction, cutter head, horizontal auger or horizontal cutter types) remove and transport sediments through pipelines as a liquid slurry. Solids are removed from the slurry either through settling in spoils impoundment basins, which require large areas of available land, or through mechanical solids separators. Suction dredges have low to moderate sediment resuspension characteristics. The Tahoe Dredge Study recommended testing of the Eddy Pump for effectiveness to remove sediments while causing low resuspension, as this dredge has the capability to remove high concentrations of solids (> 70 percent) while creating very low turbidity.
- Impoundment basins (or settling tank systems) must be properly designed and sized to achieve optimum settling of solids. For suction dredges, impoundment basins afforded good removal of coarser solids, while finer particulates were not always effectively removed. Turbidity and nutrient removal necessary to achieve discharge standard limits after 6 consecutive days of dredging was not always possible. The addition of

alum polymer flocculent proved effective in reducing turbidity and TP in spoil waters of impoundment basins, but pose concerns of potential toxicity of certain forms of aluminum and effects to water pH.

- Operational controls are important for minimizing sediment resuspension. For bucket dredges, these include: hoist speed, deliberate placement of material and avoiding smoothing of the bottom. For hydraulic suction cutter dredges, these may include careful control of: cutter pressure, engine RPM, cutter RPM, and dredge pull speed.
- The turbidity silt curtains used for containment are largely effective in isolating dredge area impacted water of high turbidity and nutrient content from the main lake in many of the historical projects. Maximum turbidity and nutrient concentrations outside the turbidity curtains were often near or only slightly higher than background for many projects.
- Time elapsed between completion of dredging and permission to remove turbidity curtains ranged up to 17 days. Projects which utilized pumping and removal of dredge area water were able to remove silt curtains much sooner.

TKPOA West Channel Maintenance Dredging and Beach Replenishment Project AIP Monitoring Results:

Studies of EWM control actions in Upper Saranac Lake in New York report less EWM reinfestation when finer textured bed substrate materials are reduced (Kelting D.L. 2007; Kelting D.L. et al. 2015). Dredging to shallow bed substrate depths in infested marinas and channels remove AIP including roots systems, and may have beneficial effects if accumulated fine grained bed substrates and organic materials (i.e., muck) are removed, allowing for reestablishment of native plants in coarser bed substrates. Specific to the Lake Tahoe Region, the TKPOA West Channel Maintenance Dredging and Beach Replenishment Project conducted in 2015 was the first project to test mechanical dredging as an AIP control method, requiring removal of AIP and root zone materials from an approximately 24,000 square foot infestation area prior to maintenance dredging of the channel. The goal was to achieve 99 to 100% plant removal, which resulted in approximately 12 cubic yards of plant material being removed and transported to the South Tahoe Refuse Compost Facility in South Lake Tahoe, CA. A comprehensive aquatic plant survey was conducted in the project area in late June-early July 2014. A total of 683 samples were taken in the West Channel and lagoons, and approximately 25 survey data points were located within the project area. Within the project area, primary plant species identified included EWM, CLP, Elodea (*Elodea canadensis*), and some leafy pondweed (*Potamogeton foliosus*) (Sierra Ecosystems Associates 2014). A cursory survey for aquatic plants was conducted on September 21, 2014 in the West Channel of the project area. In this limited survey, a 25- to 27-foot swath of Richardson's pondweed (*Potamogeton richardsonii*) extending roughly 300 feet in length from the end of the sheet pile wall into the Lake was observed (Aquatic Environments 2014).

The Contractor used a long-reach track excavator with a 1-cubic-yard bucket attached. The excavator arm was marked with black paint to assist the operator in determining the depth at which the equipment was digging. All dredging operations took place within the turbidity curtain containment area. The barge and two excavators were positioned to work with one excavator dredging material from the channel, and one excavator transporting material to shore. As the excavator bucket scraped the benthic surface, plants with intact roots were readily removed from the coarse, sandy substrate. The excavator operator deposited the material onto the barge where top-side workers removed all visible plant material and placed it in 1 cubic yard permeable white poly bags. Throughout the operation, the Contractor used a small boat and a long-handled skimmer to capture plants and plant fragments that floated to the surface and to the edge of the project area perimeter (contained by turbidity curtains). Skimming of visible floating plant material occurred from the start of the project on April 3, 2015 and continued daily until April 10th. After April 10, skimming was performed as needed by boat or by walking into the water in chest-high waders or wetsuits.

Although a post-dredge survey of this project area was not conducted by the Contractor as planned, N. Cartwright, a trained Tahoe RCD staff, was able to conduct a follow-up survey on Wednesday June 17, 2015 in the West Channel. The survey was conducted by paddling the project area via kayak and collecting grab samples using a weed rake. Approximately 20 samples were taken along the perimeter and in the center of the removal area. Within the project area, the majority of samples did not retrieve any plant material. The two species detected were EWM and elodea (*Elodea canadensis*). No mature plant growth was found in these samples, and the minimal plant growth that was collected was new growth (2-4 inches tall). Dense patches of plants were found growing directly adjacent (outside) to the project area perimeter. The plant samples collected in these dense areas were full-grown plants ranging from 6 to 12 inches in height. Plants collected outside of the perimeter of the project area were EWM, CPW, and elodea.

Post-survey findings were that the contractor successfully complied with the permit conditions and removed the infestation of AIP from the project area and from dredge materials used for beach replenishment. Post-survey weed rake samples did not contain mature plants, but young plants detected at the perimeter of the project area were expected to recolonize the West Channel quickly. The TKPOA lagoons provide ideal growth conditions for native and non-native aquatic plants due to favorable habitat conditions, such as water temperature, low wave actions and higher nutrient concentrations, which in turn increases risk of infestation of the West Channel from fragments originating in the lagoons. The recommendation was to immediately follow AIP removal by dredging with additional AIP control measures, specifically installing benthic barriers over the newly dredged areas to prohibit plant reestablishment. Noting, however, that at the West Channel there is the possibility that wave action would transport sediments on top of the barriers, making them difficult to remove, as well as providing suitable substrate for AIP to grow on top of the barriers. The study concluded that dredging could be an effective means of AIP removal where a discrete AIP population is isolated from other plant infestations. In that situation, placing barriers over the underwater substrate post-dredging, supplemented with diver-assisted suction removal, might provide effective control for EWM. However, species such as CPW employ reproductive strategies (i.e., timing of growth and reproduction, longevity of turion survival and propagation via rhizomes relative to turions) that are not well understood in Lake Tahoe's environment (Wittmann and Chandra 2015). The findings were included in the final project reporting submitted to USACE, Lahontan Water Board, CDFW and CADSL (RO Anderson 2015).

APPENDIX B: SCOPING SUMMARY REPORT

Lake-Wide Control of Aquatic Invasive Plants Project

Scoping Summary Report

Introduction

The Tahoe Regional Planning Agency (TRPA) and Tahoe Resource Conservation District (Tahoe RCD) sought public comment on the scope of the Initial Environmental Checklist (TRPA) and Initial Study (CEQA) for the project beginning on February 13, 2019.

Except for planning matters, ordinary administrative and operational functions of TRPA, or exempt classes of projects, TRPA uses either an initial environmental checklist (IEC) or environmental assessment (EA) to determine whether an environmental impact statement will be prepared for a project or other matter. Based on preliminary scoping of environmental issues, TRPA proposes to prepare an IEC for the project. If TRPA determines that the IEC will not provide sufficient information to make the findings in TRPA Code of Ordinances subsection 3.3.2, TRPA will require the preparation of an environmental assessment (EA) or environmental impact statement (EIS).

An IEC will be prepared prior to a decision being made by the TRPA Governing Board on the project. Based on the information submitted in the IEC, and other information known to TRPA, TRPA shall make one of the following findings and take the identified action:

A. The proposed project could not have a significant effect on the environment and a finding of no significant effect shall be prepared in accordance with TRPA's Rules of Procedure;
B. The proposed project could have a significant effect on the environment but, due to the listed mitigation measures that have been added to the project, the project could have no significant effect on the environment and a mitigated finding of no significant effect shall be prepared in accordance with TRPA's Rules of Procedure; or
C. The proposed project may have a significant effect on the environment and an environmental impact statement shall be prepared in accordance with this chapter and TRPA's Rules of Procedure.

Based on preliminary scoping of environmental issues, Tahoe RCD proposes to prepare an Initial Study (IS) for the project. An IS provides a preliminary assessment of the potential environmental impacts of the proposed project. The IS will determine whether a Negative Declaration or Environmental Impact Report (EIR) must be prepared. If the IS determines that there is no substantial evidence that the project or any of its aspects may cause a significant effect on the environment, then a Negative Declaration (or Mitigated Negative Declaration) will be prepared.

The public scoping notice was distributed to public agencies, stakeholders and interested parties, requesting written and electronic comments on the proposed project by March 15, 2019. In response to the request for public comment on the scope of the environmental documentation, formal input was received from the following organizations and individuals on the dates indicated in the list below.

Name	Date
California Tahoe Conservancy (CTC)	February 13, 2019
Tahoe City Marina	February 14, 2019

Sierra Club Tahoe Area Group	March 3, 2019
League to Save Lake Tahoe	March 6, 2019
California State Lands Commission (CA State Lands)	March 15, 2019
Nevada Tahoe Resource Team • Nevada Division of State Lands • Nevada Department of Wildlife • Nevada Division of State Parks	March 19, 2019
Tahoe Yellow Cress Adaptive Management Working Group (TYC AMWG)	March 20, 2019
Tahoe Water Suppliers Association (TWSA)	March 22, 2019
USDA Forest Service Lake Tahoe Basin Management Unit (LTBMU)	April 16, 2019

Summary of Comments

Comments received are categorized based on their relevance to the project and organized according to comment focus area. Comments were grouped into the following groups: project area and project description clarifications; consideration of design features and mitigation measures; purpose and need and project objectives; and potential resource impacts.

Project Area and Project Description Clarifications

Page 2 states 'each Lake Tahoe marina, tributary waters adjacent to their confluence with the Lake'… I am having trouble understanding what is meant by this statement as far as scoping goes? *(Tahoe City Marina)*

Do high/low lake level affect AIS priorities? The UV light report should explain whether this technique works better in low or high lake levels. If it's too late to add this to the UV light report then please address this question in the CEQA document, e.g. explaining which control methods would work best in low or high lake levels. *(California Tahoe Conservancy)*

While the Sierra Club Tahoe Area Group (SCTAG) supports a thorough environmental review of the proposed control measures, the documents must comprehensively analyze the potential impacts from the proposed Project and include specific details regarding the parameters of use. For example, while the notice discusses the successful removal of AIP resulting from mechanical dredging that was done at the Crystal Bay Marina for improved boater access, SCTAG is concerned about the potential for significant increases in mechanical dredging as part of the proposed Project. Such dredging activities must not be used to support or encourage additional boater access. *(Sierra Club Tahoe Area Group)*

The environmental review will also need to examine the existing conditions and topography in the Crystal Bay Marina and assess other locations where conditions may be comparable such that mechanical dredging for AIP removal may be explored. *(Sierra Club Tahoe Area Group)*

We encourage the Tahoe RCD and TRPA to investigate as part of the Project the potential for removing the current 5-acre limit on the use of bottom barriers for controlling aquatic invasive plants in Lake Tahoe. Restricting bottom barriers to 5 acres in a given year has been a significant constraint on control of Eurasian watermilfoil and curly-leaf pondweed each summer; removing this limit would allow for a more aggressive approach to controlling these invasive plants. *(League to Save Lake Tahoe)*

Portions of the Project located below Lake elevation 6,223 feet are located within state of California sovereign land, and portions below elevation 6,228.75 feet are within a public trust easement. As a result, formal authorization for use of State sovereign land will be required from the California State Lands Commission for any portion of the Project encroaching on State sovereign land. Work located at or below the ordinary high-water mark (OHWM) of 6,228.75 feet will be required to include measures to preserve and maintain legal public access. *(CA State Lands)*

Commission staff understand that the Project will include the same Project location and control methods previously analyzed with the 2014 IS/MND and new control methods and location proposed with the current project. Commission staff recommends that the Tahoe RCD pursue a Subsequent MND to build from the 2014 analysis, rather than attempting a new CEQA document for the current Project. Preparation of a Subsequent MND could have a reduced scope of work and cost. *(CA State Lands)*

The Project Description must clearly distinguish whether proposed dredging would be maintenance of existing legally authorized dredge sites, expansion of existing legally authorized dredge sites, or for new dredge sites where dredging has not previously occurred. Any proposal for new dredging must carefully consider the regulatory requirements of TRPA and the Lahontan Regional Water Quality Control Board, and would likely require preparation of a MND or potentially an Environmental Impact Report/Statement if significant and unavoidable impacts are identified. *(CA State Lands)*

The Commission authorized Lease 8994.9 to the Tahoe RCD for AIP control activities in 2014. New AIP control methods and activities within the Commissions jurisdiction will require a lease amendment with the Commission. Please identify the Commission as a public agency requiring a lease authorization for new control work below the OLWM, and with authority to ensure activities between the OHWM and OLWM are compatible with the Public Trust easement. *(CA State Lands)*

Nevada Division of State Parks (NDSP) supports the long-term goals of the AIP program, even if it generally results in short term disruption to recreation or has an adverse economic impact to the park, given of course that we have a positive cost benefit analysis with respect to the effort. We support the study and review of the potential presence and density of aquatic invasive plants at specific NDSP locations, in this case Cave Rock and Sand Harbor. Will NDSP have access to survey mapping of those areas? *(Nevada Tahoe Resource Team)*

The scoping notice states the project location is composed of "suitable habitat" within the basin, including Lake Tahoe, tributaries, adjacent marshes and the Truckee River. Please define what is considered suitable habitat and how it may change with climate change projections. Also, please describe the distances upstream that will be analyzed within tributaries in the project area and why and how you chose the lengths to be analyzed. When defining the project area, please also address constructed water bodies, such as Lake Barron and Quail Lake. (LTBMU)

Because the environmental document is intended to be programmatic, we suggest removing specific known locations (e.g., Truckee River) and writing in broader resource language to include currently known locations as well as future detections. (LTBMU)

> **Response: The project description will be updated to include more detail for each of the proposed AIP control measures (e.g., limits on acreage and location of use, etc.) and location where control measures are expected to be permitted to address the questions received. For example, the description for dredging will limit its use to locations where past dredging has occurred, requirements for public access will be defined for control areas, and permitting/lease requirements will be summarized for control types and locations. The current Project includes both new control measures (UV Light and Dredging) and new control locations (tributaries and marsh lands) not previously studied in the 2014 environmental documentation, so Tahoe RCD and TRPA propose to prepare a complete IS/IEC for the Project.**

Consideration of Design Features and Mitigation Measures

It will be imperative that the Project incorporate specific and detailed criteria and limitations that will regulate any mechanical dredging done as part of this project to ensure all impacts are mitigated and that dredging will not promote, directly or indirectly, increased boater access. *(Sierra Club Tahoe Area Group)*

The League supports efforts to expand control methods for aquatic invasive plants in Lake Tahoe to include UV light and dredging. That said, given these are novel methods for Tahoe, we encourage Tahoe RCD and TRPA to engage in more detailed planning for both methods, including implementing limits on the size of project areas when utilizing these new tools. *(League to Save Lake Tahoe)*

We encourage Tahoe RCD and TRPA to utilize all BMPs available in implementing these control measures, closely monitor control projects as they are implemented, and utilize adaptive management to quickly adjust projects based on any unforeseen challenges or issues from the use of these new techniques (UV light and dredging). *(League to Save Lake Tahoe)*

The Tahoe Yellow Cress Adaptive Management Working Group (TYC AMWG) would like to review any draft mitigation measures developed to protect Tahoe yellow cress. *(Tahoe Yellow-Cress Adaptive Management Working Group)*

Whenever control work is proposed within ¼ mile of a drinking water intake, please notify the Tahoe Water Suppliers Association (TWSA) and the water provider that owns the water intake before work commences. *(TWSA)*

> **Response: TRPA and Tahoe RCD are preparing environmental documentation to disclose and mitigate potentially significant effects related to each resource area with emphasis on recreation, water quality, and biological resources. The comments on these topics help inform the environmental analysis and development of any necessary project design features or mitigation measures.**

Purpose and Need and Project Objectives

It must be made clear in the environmental review and future project documents that this environmental review cannot be relied upon as a substitute for environmental review by future applicants proposing to dredge for the purposes of supporting or increasing boater access. *(Sierra Club Tahoe Area Group)*

Once approved by Tahoe RCD and TRPA, the Project's environmental documentation could potentially benefit other entities (e.g., marinas, other public agencies, private property owners, non-governmental organizations) who wish to implement AIP control projects by covering the environmental documentation needs for these entities and their project sites. *(CA State Lands)*

There is a need to identify if there is a point where impacts from control methods exceed the benefits of removal, both from an economic and water quality perspective. Is there a point where AIP removal becomes too expensive or begins to have negative environmental impacts? Is there a point where removal becomes purely an annual maintenance issue, or an issue of limiting spread rather than one of complete removal? *(Nevada Tahoe Resource Team)*

We encourage the Tahoe RCD to satisfy federal, state and local environmental documentation requirements, including identifying federal representatives to help ensure NEPA compliance and ESA consultation requirements. (LTBMU)

> **Response: The purpose and need for the project and the list of project objectives will be updated to address the comments concerning these topics. For example, the description of purpose and need will clearly indicate that the project is for control of aquatic invasive plants and not for increasing boater access. Tahoe RCD and its agency partners will continue to discuss the nexus for compliance with NEPA, assignment of a federal lead agency, and to help streamline permitting and implementation of control efforts.**

Potential Resource Impacts

From page 2 "New research indicates that using ultraviolet light (C wavelength also called UVC), a short-wave electromagnetic radiation light that damages the DNA and cellular structure of AIP and their fragments, may be an effective method to kill and control AIP species, as laboratory tests resulted in complete mortality." I am hoping that the environmental document will identify whether or not this method had unwanted negative effects on other form of flora and fauna. *(Tahoe City Marina)*

The environmental review should identify all existing native fish habitat sites. *(Sierra Club Tahoe Area Group)*

Given the region-wide scale of the Project, the environmental document must consider all past, present and reasonably foreseeable project that could contribute cumulative impacts with the proposed control activities of the Project. Relevant projects should include other aquatic invasive species control projects and the ongoing need for marinas and other boat launching facilities to perform periodic maintenance dredging. *(CA State Lands)*

Comments from the *Nevada Tahoe Resource Team*:

> There are 10 – 20 active osprey nests on Tahoe's shoreline in any given year, and these locations can be particularly sensitive to disturbance from April 15 – August 15. Prolonged human activity within 1/4 mile of the nest increases the risk of nest abandonment or failure. Therefore, it is recommended to implement AIP control methods prior to April 15 or after August 15 at control sites that are within 1/4 mile of an active osprey nest.
>
> Will AIP be removed after UV light treatments, or will dead plants remain in the water? Is there any evidence that decomposition of those plants will cause clarity issues through gradual release of organic matter into the water?
>
> Mechanical disturbance of sediment can have negative impacts on native aquatic species. Native fish species, as well as non-native sportfish species, utilize a large portion of the nearshore for different stages of their life history, and the disturbance of these areas may have unintended impacts. Special precautions should be taken in areas near tributaries, as these are the areas that are most critical to native fish species in Lake Tahoe.
>
> There is evidence that UV light can impact fish species in all life stages, from egg to adult. Since the use of this technology is new at Lake Tahoe, the impacts to native fish (including eggs), macroinvertebrates, and vegetation should be thoroughly evaluated.
>
> The use of permeable benthic barriers will preclude certain fish species from spawning in locations where they are deployed. Measures to avoid or mitigate impacts to spawning should be evaluated.
>
> Tahoe yellowcress occupies shoreline habitat in close proximity to the potential submersed aquatic plant habitat shown on the map which is attached to the scoping notice. The proposed

activities would have the potential to affect Tahoe yellowcress habitat (and possibly the plants) if control activities involved access from the shore rather than the lakeside via a barge or boat. Clarification of this access question would help determine if there is any potential effect on Tahoe yellowcress habitat and plants. Tahoe yellowcress is listed as critically endangered by the State of Nevada NRS 527.270.

There is some concern about general impacts to recreation (boating and swimming) from benthic barriers, like what has occurred at Sand Harbor with the Asian Clam mats. That project resulted in excessive buoys to mark the benthic barriers (mats), reduced access for boaters, increased congestion at boat ramps and boating areas, and there was damage to mats from boaters. Although, it should be pointed out, even with the impacts we've seen at Sand Harbor recently, the overall clam project has been a positive. With future activities, can we set project goals within the framework of defined impacts?

Tahoe yellow cress - Please make sure the biological consultation addresses potential impacts to yellow cress because it is also found in some tributaries, not just Lake Tahoe shoreline and access for AIP work could disturb plants. The Taylor/Tallac EA recently prepared by the LTBMU included a requirement for botanist to confirm presence/absence before work begins in potential habitat areas so it can be fenced if needed. (personal communication, Sarah Muskopf, 4/17/19)

Response: TRPA and Tahoe RCD are preparing environmental documentation to disclose and mitigate potentially significant effects related to each resource area, with emphasis on recreation, water quality, and biological resources. For example, results from the UV Light study conducted at Lakeside Marina will be used to inform potential impacts from its use in other locations. Design measures (e.g., mitigation measures) recommended in agency comments and used in other locations where the proposed control measures were permitted, will be considered to ensure the Project does not create adverse impacts on resources.