

SECTION ONE – SUMMARY

1. Project Title: Invasive Aquatic Weed Survey and Removal in Lake Tahoe

2. EIP Number: # 525 – Distribution Study

3. Funding Source and Amount Requested in this Funding Round:

Bureau of Reclamation – Lake Tahoe Regional Wetlands Development Program

4. Total Estimated Project Cost:

\$431,797.00

5. Total Cost of the Phase these Funds will be Applied to:

\$431,797.00

6. Total Project Funding of Current Phase:

| Funding Source | Amount |
|---|---------------------|
| Bureau of Reclamation | \$339,897.00 |
| Tahoe Divers Conservancy | \$60,000.00 |
| California Department of Parks and Recreation | \$8,000.00 |
| California State Lands Commission | \$21,400.00 |
| Tahoe Regional Planning Agency | \$2,500 |
| TOTAL | \$431,797.00 |

7. Draft Goals of the Completed Project:

1. Improve fish habitat, aquatic plant communities, and water quality thresholds for Lake Tahoe
2. Identify invasive aquatic weeds and their distribution in the Lake Tahoe Basin
3. Initiate eradication, control, and management of invasive aquatic weeds in Lake Tahoe
4. Develop long-term aquatic weed removal strategy for the Lake Tahoe Basin

8. Intended Outcomes of this Phase of the Project:

1. Survey for, identify, and document invasive aquatic weed distribution lake-wide
2. Establish aquatic weed removal techniques and abilities in the Lake Tahoe Basin
3. Eradication, control, and management of aquatic weeds in Emerald Bay and Ski Run Marina
4. Lake-wide near shore turbidity monitoring
5. Develop aquatic weed monitoring protocol

9. Deliverables of the Project/Phase:

1. Documentation of necessary permits and authorization agreements
2. Complete pre- and post-project survey of native species and aquatic weed infestation in Emerald Bay
3. Annual summary report of aquatic weed removal in Emerald Bay
4. Complete pre- and post-project survey of native species and aquatic weed infestation at Ski Run Marina
5. Annual summary report of aquatic weed removal in Ski Run Marina
6. Annual lake-wide near shore Turbidity Monitoring Report
7. Lake-wide Aquatic Weed Survey
8. Aquatic Weed Monitoring Protocol
9. Final Project Report

SECTION TWO – PURPOSE AND NEED

10. Briefly Describe the Need and Purpose of the Project:

There are many threats to the infamous clarity and water quality of Lake Tahoe, and only recently has attention turned to addressing the threat of invasive aquatic weeds, particularly Eurasian watermilfoil (EWM). Significant 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 invasive plant introduction in all of the lower 48 states. EWM is a non-native aquatic plant that has spread rapidly across the country with the help of boaters who unintentionally transport and spread plant fragments that adhere to boats and trailers. It has been present in Lake Tahoe for over 10 years, and after the flood of 1997, EWM escaped from Lake Tahoe into the Truckee River, and has now been documented downstream as far as Verdi, NV. In the 2003 Lake Tahoe aquatic weed survey, EWM was found to be rapidly expanding in Emerald Bay, and colonized most marinas and some protected coves and beaches around Lake Tahoe.

Eurasian watermilfoil and other invasive aquatic weeds grow prolifically and aggressively invade native aquatic plant 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 fresh water ecosystems quickly when fragmented by boat propellers and by way of buds and surface runners. It also tolerates a wide range of environmental conditions including low light levels, high or low nutrient waters, and freezing water temperatures. EWM also begins to create its own habitat by trapping sediment and initiating a favorable environment for further establishment. For these reasons, EWM can aggressively out-compete and eliminate native aquatic plants. In addition to EWM, an equally aggressive aquatic weed, curly-leaf pondweed (*Potamogeton crispus*), has recently been detected in Lake Tahoe.

Prevention and early detection are our best defense and offers the best hope for eradication, or successful management of an infestation. Once widespread establishment has occurred, EWM is very difficult and costly to control. Marinas typically use mechanical harvesters to mow the weed below the water surface to maintain boat access. This removal process, however, releases plant fragments that can be carried great distances, contributing to its spread. New weeds are capable of growing from tiny fragments as small as one inch long. In 2005, a pilot removal project by California State Lands Commission was conducted by an Idaho-based contractor at Emerald Bay State Park to test the diver-assisted suction removal method to remove EWM (see Appendix A for more detail). Currently there are no lake-wide long-term aquatic weed management and control efforts in Lake Tahoe, nor are there experienced local aquatic weed removal specialists.

This aquatic weed removal project will address four of the nine Tahoe Regional Planning Agency thresholds including, water quality, fish habitat, vegetation, and recreation. The water quality threshold aims to reduce loads of sediment and algal nutrients. One of the concerns of EWM is that it accelerates nutrient cycling by moving nutrients such as phosphorus out of lake sediments and into the water, or releases nutrients into the water during the decay process, both of which contribute to algae growth and decreased water clarity. Pertaining to the goal of the fish habitat threshold is the policy to encourage habitat improvement projects because fisheries habitat, such as feed and cover, is currently not in attainment. The Fisheries Technical Advisory Group identified the proliferation of invasive aquatic weeds, such as Eurasian watermilfoil, as negatively impacting fisheries. The vegetation threshold recognizes the threat of invasive weeds to the native vegetation communities, both aquatic and terrestrial. Terrestrial natural areas like Osgood Swamp, and aquatic areas such as Lake Tahoe are being negatively impacted by EWM infestations. The recreation threshold includes, but is not limited to, swimming, fishing, and use of marinas. This weed creates problems for boaters, recreationists, marina managers, and landowners as the dense, matted growth restricts boating, water skiing, fishing, swimming, and has caused drownings.

The purpose of this project is to develop a long-term removal strategy and monitoring protocol, and conduct lake-wide surveys and turbidity monitoring. This project will be dedicated to planning and

permitting, training for the Tahoe Divers Conservancy, aquatic plant removal, surveys, and monitoring and turbidity monitoring. An aerial reconnaissance survey is needed to provide overall guidance to the aquatic plant surveys. One critical barrier to the long-term invasive aquatic weed management is the availability of the appropriate equipment. This equipment is not commercially available. The long-term use of the equipment will include other purposes such as lake-wide turbidity monitoring and aquatic plant surveys. Once the equipment is purchased, the TRPA will take ownership of the boat and associated equipment. This phase of the project will continue the removal efforts in Emerald Bay and initiate aquatic weed removal at Ski Run Marina. The technique used in the pilot project was successful at removing a portion of the infestation, and it is anticipated that it can be used effectively in other infested areas around Lake Tahoe.

Aquatic weed education and outreach is currently being tackled by the bi-state Lake Tahoe Basin Weed Coordinating Group (LTBWCG). The education and outreach effort is an important component to aquatic weed management as human activity is the largest contributor to the spread of aquatic weed infestations. One major accomplishment of the LTBWCG is the development of aquatic weed signage at marinas around the Lake. These signs will be erected in spring 2006 and will inform water recreation enthusiasts of the role they can play in reducing the spread of aquatic weeds such as EWM.

SECTION THREE- BUDGET, FUNDING MATCH AND SCHEDULE

11. Funding Match: Complete the following table showing all sources of funding for the current phase of the project. Also indicate which funding sources will count as a match. Please add any necessary narrative if it would be helpful to explain matching requirements.

| Funding Source | Amount | % | Match Type* |
|---|---------------------|-----|-------------|
| Bureau of Reclamation | \$339,897.00 | 79 | |
| Tahoe Divers Conservancy | \$60,000.00 | 13 | Other |
| California Department of Parks and Recreation | \$8,000.00 | 2 | State |
| California State Lands Commission | \$21,400.00 | 5 | State |
| Tahoe Regional Planning Agency | \$2,500.00 | 1 | State |
| Total | \$431,797.00 | 100 | |

*Local, State, Federal, or Other

12. Detailed Budget for this Phase: Please include a budget based on general tasks focused on deliverable products. A previously developed budget for this task may be attached in the appendices. But please note in this section that the budget is attached.

***Detailed budget is attached as Appendix C**

| Task | Budget |
|------------------------------|---------------------|
| Personnel and Administration | \$104,626.00 |
| Planning and Permitting | \$3,000.00 |
| Contracted Services | \$234,820.00 |
| Equipment Expenses | \$89,350.00 |
| TOTAL | \$431,797.00 |

13. Detailed Schedule for this Project and Phase: Please provide a schedule for this phase of the project focused on the Tasks and Deliverables. A table or list of tasks would be the best format. This item may be combined with item 12 if it can be done clearly

| Schedule | Date |
|---|--|
| Permitting | April/May 2007 |
| Training, survey, and removal Emerald Bay | April/May 2007 |
| Lake-wide aquatic weed survey | August 2007 & 2009 |
| Spring survey Emerald Bay/Ski Run Marina | April/May 2008 & 2009 |
| Spring removal Emerald Bay/Ski Run Marina | April/May 2008 & 2009 |
| Fall survey Emerald Bay/Ski Run Marina | September/October 2008 & 2009 |
| Fall removal Emerald Bay/Ski Run Marina | September/October 2008 & 2009 |
| Lake-wide near shore turbidity monitoring | August 2007, 2008, & 2009 |
| | |
| Term of Project | April 30, 2010 |

SECTION FOUR – ADDITIONAL INFORMATION

14. Reporting and Other Requirements

| Report | Date |
|---|--------------------------------------|
| Annual summary report Emerald Bay removal | December 31, 2008 & 2009 |
| Annual summary report Ski Run Marina | December 31, 2008 & 2009 |
| Annual turbidity monitoring report | December 31, 2007, 2008, 2009 |
| Lake-wide aquatic weed survey | December 31, 2007 & 2009 |
| Final project report Emerald Bay | April 30, 2010 |
| Final project report Ski Run Marina | April 30, 2010 |
| Final lake-wide turbidity and survey report | April 30, 2010 |
| | |

15. Required Attachments:

- A. Cover Letter Signed by Authorized Agency of Receiving Entity.
- B. Location Map
- C. Project Boundary Map (maybe included in Location Map)
- D. A printout or photocopy of the relevant EIP Data Sheet from the Current Update of the EIP
- E. If there will be property acquisition attach Form B (CTC form)

16. Appendices:

- 1. Appendix A – Description of Method and Example Scope of Work
- 2. Appendix B – List of Cooperating Agencies and Acronyms
- 3. Appendix C – Detailed Budget Based on General Tasks for Deliverables