



Meyers, CA

Community Watershed Partnership



R|O|Δnderson



*Final Watershed Strategy
Report - February 2015*

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ACRONYM LIST

TMDL	Total Maximum Daily Load
BMP	Best Management Practices
Tahoe RCD	Tahoe Resource Conservation District
CWP	Community Watershed Partnership
SNPLMA	Southern Nevada Lands Management Act
NRCS	Natural Resources Conservation Service
EPA	Environmental Protection Agency
CTC	California Tahoe Conservancy
USFS	United States Department of Agriculture - Forest Service
TRPA	Tahoe Regional Planning Agency
TAC	Technical Advisory Committee
PLRM	Pollutant Load Reduction Model
NHC	Northwest Hydraulic Consultants
SFR	Single Family Residential
Water Board	Lahontan Regional Water Quality Control Board
SEZ	Stream Environment Zone
CALTRANS	California Department of Transportation
EIP	Environmental Improvement Program
TTD	Tahoe Transportation District
FSP	Fine Sediment Particles
TN	Total Nitrogen
TP	Total Phosphorus
CICU	Commercial-Industrial-Communications-Utilities

INTRODUCTION

Lake Tahoe is among the largest, deepest, and clearest lakes in the world. Its cobalt blue appearance, spectacular alpine setting, and remarkable water clarity is recognized worldwide. Recreational opportunities and scenic vistas have made Lake Tahoe a top national and international tourist destination. While visibility into the lake's depths is currently at 70 feet, it is listed as impaired because over thirty feet of clarity has been lost since the late 1960s. To address the impairment, the Lake Tahoe Total Maximum Daily Load (TMDL) program was adopted in 2011; it brought with it new regulatory requirements for state and local stormwater jurisdictions to reduce urban pollutant loads to Lake Tahoe.

Approved by the Environmental Protection Agency and the states of California and Nevada, the TMDL sets targets for a significant reduction of fine sediments, nitrogen, and phosphorus flowing to Lake Tahoe. Currently, stormwater jurisdictions are required to implement urban best management practices (BMPs) to decrease pollutant loading from urban runoff as part of their TMDL permit. Through this process area-wide stormwater treatment has become a preferred strategy for effective TMDL implementation. Expected benefits include costs savings related to the economy of scale, and effective maintenance and tracking of pollutant loads.

In 2014, the Tahoe Resource Conservation District (Tahoe RCD) reached out to Meyers through a program called the Community Watershed Partnership to provide landscape conservation planning and technical services related to BMP implementation and area-wide stormwater planning. As part of this community engagement effort the Tahoe RCD also surveyed Meyers' homeowners and business owners on willingness to support the management and treatment of stormwater on an area-wide scale in lieu of implementing individual infiltration BMPs.

PROJECT BACKGROUND

The Community Watershed Partnership (CWP) was developed through funding provided by the Southern Nevada Public Lands Management Act (SNPLMA), and sponsored by both the Natural Resources Conservation Service (NRCS) and the Environmental Protection Agency (EPA). The funding for this program is intended to identify and address natural resource concerns or needs at a watershed level, and is designed to engage a variety of stakeholders to help facilitate communication between landowners, the general public, and Basin managers while furthering TMDL implementation and the restoration of Lake Tahoe.

The CWP approach compliments the many environmental improvement projects implemented around the Lake Tahoe Basin by the California Tahoe Conservancy (CTC), U.S.D.A. Forest Service (USFS), the Counties of El Dorado and Placer, and the City of South Lake Tahoe (local stormwater jurisdictions). Improvements gained in water quality have largely resulted from urban capital improvement projects, as well as restoration work in stream environment zones. In addition to implementing large scale projects, there are opportunities for each private property owner to contribute to watershed restoration efforts by either implementing individual water quality BMPs on their parcel, or by partnering with stormwater jurisdictions on area-wide treatment. Ultimately, successful implementation of BMPs on both the public and private scale will move Lake Tahoe closer to attaining its clarity goals. How each neighborhood or urban center executes this process will be a focus for Basin managers for the next several decades.

In 2002, the Tahoe RCD, the Nevada Tahoe Conservation District, NRCS, and the Tahoe Regional Planning Agency (TRPA) adopted a Memorandum of Understanding to establish a partnership that would provide technical support to homeowners, contractors and property managers in implementing water quality BMPs. Through grant funded incentive programs, the Tahoe RCD and its partners provided

cost free property evaluations and BMP implementation plans for over fifteen years, however deadlines for Basin-wide compliance have come and gone since 2008. After more than a decade, only about three out of every ten private properties on the California side of the Tahoe Basin has achieved BMP compliance; the level of implementation in Meyers is even lower at approximately 17 percent.

The Meyers community was selected for CWP engagement due to several factors: the development of the Meyers Area Plan by El Dorado County and TRPA, low BMP compliance, and the potential for pollutant generation (Figure 1).

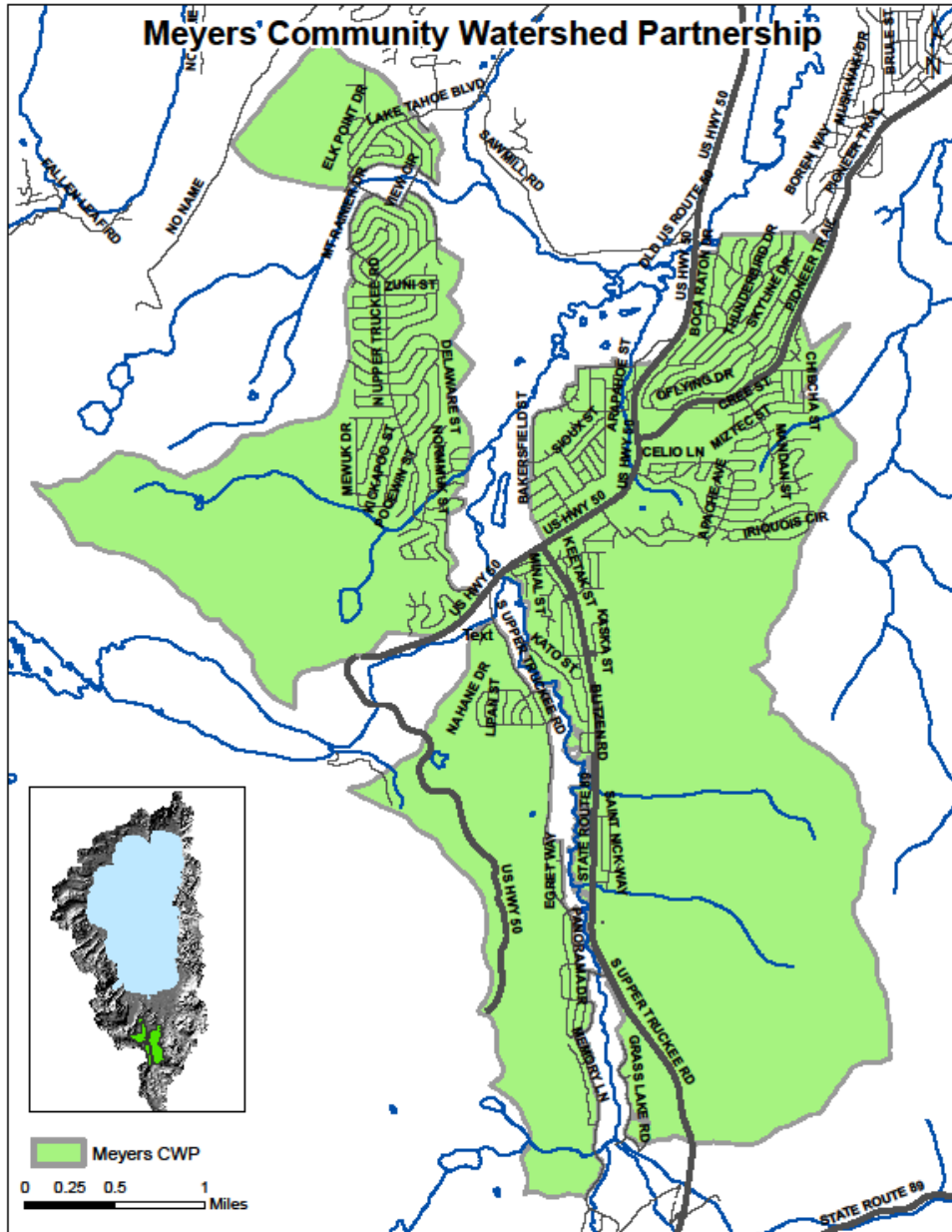


Figure 1. Community Watershed Partnership Project Area, Meyers California

PROJECT SCOPE

This report focuses on the Meyers' CWP strategy and is intended to provide useful TMDL implementation information to Basin managers, regulators, and stormwater jurisdictions. The Meyers community was identified as a priority watershed for development of a Community-based Watershed Strategy through a CWP ranking process that evaluated proximity to the lake, slope, soils, precipitation, and modeled pollutant load contributions. The development of the CWP Strategy was guided by a Technical Advisory Committee (TAC) led by the Tahoe RCD, and in partnership with EPA, the CTC, the USFS, El Dorado County, and the Lahontan Water Board to ensure the project was well coordinated and relevant to other projects implemented in the watershed. The TAC also helped identify project goals, and provided input on project execution.



Figure 2. Meyers Commercial-Core, the Upper Truckee River, Tahoe Paradise Park with Lake Baron, Tahoe Paradise Residential Subdivision and Tahoe Paradise Golf Course.

The purpose for engaging the Meyers' community was to identify strategies for assisting private property owners, commercial businesses, and local jurisdictions with TMDL implementation through a community-based watershed approach. The goal of EPA's Community Based Watershed Strategy grant is to explore approaches that integrate strategies for public and private partnerships using education, information sharing and project implementation. Through a community-based approach it is expected there will be an increase in general knowledge of restoration objectives, opportunities for improving environmental stewardship, and enhancements to the Lake Tahoe Basin's BMP and TMDL programs.

The Tahoe RCD and its partners came up with the following goals for this project:

- Improved water quality through area-wide storm-water conveyance and treatment,
- Inclusion of elements that focused on smart use of limited space, and enhanced aesthetics within the community,
- Enriched public/private partnership opportunities for this commercial-core,
- Development of an innovative/successful template for future are-wide projects in the Region,
- Expanded business opportunities in the Meyers commercial-core.

Primary deliverables presented in this report include two separate conceptual drawings for an area-wide stormwater system (Figures 4 and 5), Pollutant Load Reduction Model (PLRM) estimates for single family residential (SFR) BMPs at theoretical rates of 30, 50 and 100 percent implementation, as well as PLRM estimates that represent potential benefits of area-wide treatment in the Meyers commercial-core, and pollutant load reduction estimates.

Key business owners were also engaged to discuss options for area-wide stormwater treatment. A case study is provided in this report that discusses the steps taken to engage the community, and the results of those efforts. A second case study describes the process for establishing a benefit assessment; if public support for such a mechanism is identified.

Traditional technical services related to SFR BMP implementation, as well as landscape conservation assistance were also provided throughout the life of this project. A table of BMP technical and landscape conservation services provided to the community are presented in Attachments A, community survey results are presented in Attachment B.

HISTORICAL INFLUENCES

Meyers was first established in 1851 as a stagecoach stop, trading post and Pony Express way station. It lies in the headwaters of the largest tributary to Lake Tahoe, the Upper Truckee River at an elevation of 6352 feet (Watershed Assessment, 2000). In 1859, Martin Smith, Meyers' original developer, sold the station to Yank Clement, who named it Yank's Station. The station provided food, lodging, water, and pasture to the thousands of travelers and animals journeying over Echo Summit. Yank's Station included a hotel, two saloons, a general store, a blacksmith shop, a cooperage, private homes, and stables and barns.



Historic Meyers California – www.SierraCollege.edu

In 1863 Carlo Giuseppe Celio homesteaded in what was known as the Upper Lake Valley of the South Shore of Lake Tahoe. Overtime, the Celio family accumulated over 4,000 acres including the town of

Meyers which they bought in 1903. In 1903 the town included a variety of businesses and 22 buildings. Celio's were operating a dairy (shipping Tahoe butter as far as San Francisco) with 125 cattle. In 1905 the Celio family incorporated and created a lumber company with milling facilities. Nineteen twelve (1912) marked the year the Celio family started harvesting beef in their new slaughter house and providing their beef to the resorts that were popping up around the Lake Tahoe Basin. Both the beef and dairy cattle spent spring through early fall grazing on the grasses from Upper Lake Valley to Meiss Meadows. Every fall the cattle were driven (cattle drive) to the Placerville area to graze and wait out winter and then they were driven back up the mountain again in the spring.

During the 1960s, the area around Meyers was part of a large (even by today's standards) residential subdivision plan originally developed by two corporations, Tahoe Paradise Homes and Tahoe Paradise Properties, Inc. The new neighborhoods were to be called Tahoe Paradise. Since that time the entire area is referred to as either Meyers or Tahoe Paradise. An area of ten (10) square miles was subdivided into 4,400 parcels.

CURRENT COMMUNITY CONTEXT

Meyers functions as one of 6 "gateways" into the Lake Tahoe Basin. However, more visitors enter the Tahoe Basin through Meyers than through any other entry point. Meyers serves as the residential, commercial and public service hub for the El Dorado County portion of the Lake Tahoe Basin. Meyers is separated from the more typical commercial centers found along the shore of Lake Tahoe and has retained its own character while accommodating many of the land uses found elsewhere in the Basin including dining, lodging and recreation.

In 1993 the Meyers Community Plan was adopted by both the TRPA and El Dorado County to guide planning and development in the Meyers commercial-core and to be responsive to the unique circumstances found within the built environment and the natural landscape. Many of today's aesthetics and environmental problems can be attributed to past actions that occurred across the Meyers' landscape without a clear vision for an effective business district, and full recognition of resource sensitivities to development.



Meyers Study Area 2014 – Flooding Across from Lira's Market.

With the adoption of the TRPA’s Regional Plan Update in 2012, an effort is underway to update existing Community Plans, which are now being called Area Plans, throughout the Basin. The Meyers Area Plan (Area Plan) was in the draft stages during the efforts of this study. The current draft of the Area Plan builds upon the 1993 plan. The Area Plan also includes lands not previously contained within the 1993 plan and includes additional implementation measures to achieve both economic and environmental objectives.

The Area Plan also includes approximately 669 acres of mixed-use (industrial, commercial and residential), recreational, and conservation land use designations. Land ownership within the area plan is 32 percent private and 69 percent public ownership (Meyers Area Plan Draft, June 2014). The public lands are primarily under the management of the US Forest Service and California Tahoe Conservancy. The Meyers Area Plan consists mainly of flat, high capability lands. There are three areas within the Area Plan that have been identified Stream Environment Zone (SEZ) and are considered environmentally sensitive and not available for additional development.

Land-use in the commercial-core is generally mixed (Figure 3); with both private and public land holdings. The biggest opportunity to work with public land holders is with the USFS and the CTC, each having substantial property at the east and west ends of the commercial core. At the east end of Meyers, there is also a small wetland in need of restoration that was identified by the TAC as an important feature that could take on re-routed stormwater while providing a hydrologic benefit through groundwater re-charge of the meadow system.

During the development of El Dorado County’s Pollutant Load Reduction Plans required by the Lake Tahoe TMDL, Meyers was identified as a significant pollutant load contributor (personal communication, Brendan Ferry, 2014). This fact, in combination with the knowledge that the Upper Truckee River accounts for 25 percent of tributary loads entering Lake Tahoe, makes this watershed a priority for implementing stormwater improvement actions.

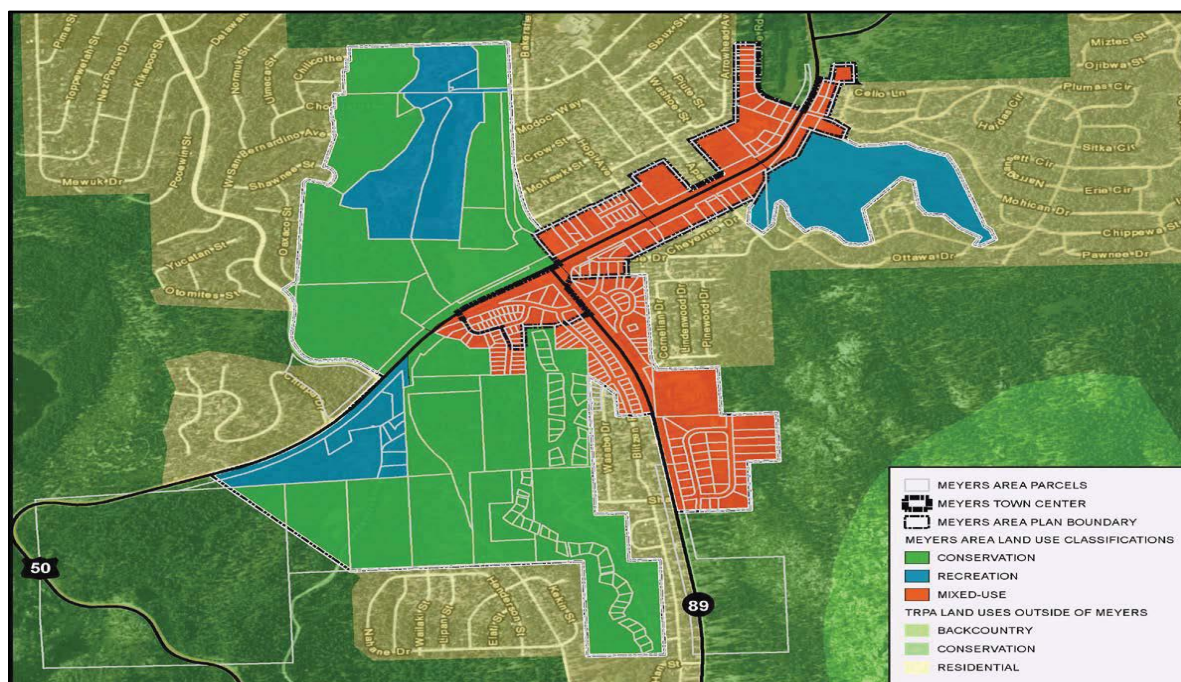


Figure 3. Meyers Land Use Map Recreated from the Meyers Area Plan; <http://www.edcgov.us/Meyers/>

MEYERS – A CASE STUDY

The first stages of this project were focused on convening a Technical Advisory Group (TAC) including agency representatives from the Tahoe RCD, EPA, El Dorado County, and the consultant team from RO Anderson. Three meetings with the TAC were held (December 13, 2013, February 10, 2014 and April 24, 2014). The project was initiated with a kick-off session that included a discussion detailing the purpose of the project, development of Critical Success Factors and a site visit to discuss opportunities, constraints and the project area scope.

The listed Critical Success Factors below represents the agreed upon outcomes to be realized with the completion of this study.

Project Critical Success Factors

- Final Report provides EPA with helpful information on TMDL strategies.
- The identified approaches can be modeled in other communities.
- The identified strategies are actionable.
- The project increases awareness of the support El Dorado County and the Tahoe RCD provide to the Meyers community.
- The community feels empowered to reach common goals and objectives.



Pictures Top Row (left to right) – Meyers Commercial-Core along US Highway 50.
Pictures Bottom Row (left to right) – Meyers Creek and Adjacent Meadow.

Based on the TAC field discussions, the consultant team was directed to develop two BMP concept strategies. The first concept was to focus on the Meyers commercial-core between Apache (near the Agricultural Inspection Station) and Pioneer Trail. The second concept was to focus on the residential area along the Apache “uphill” loop where the City had installed BMPs 20+ years ago and was likely going to need infrastructure improvements.

While on the site visit the TAC identified public lands that might be integrated with an area-wide strategy. In particular, the meadow at the north end of the study area adjacent to U.S. Highway 50 was identified as a restoration opportunity. The meadow consisting of approximately 23 parcels is impaired; running along the western edge of the meadow is the deeply incised Meyers Creek.

Between the first and second TAC meetings R.O. Anderson’s landscape architect/erosion control specialist, engineer, and project manager walked the proposed project area. At that time, the existing BMPs in the uphill neighborhood were judged to be functioning and in good working order. Based on this site visit the TAC recommended that the consultant team focus efforts on developing two concepts for the commercial-core area instead of one residential and one commercial site.

The second TAC meeting was attended by representatives from the Tahoe RCD, EPA, El Dorado County, the Lahontan Regional Water Quality Control Board, and the consultant team. Discussions included identification of current and foreseeable planning efforts in the area, opportunities and constraints, and a detailed discussion on approaches to BMP concepts; the following project summary information resulted.

Project Summary Information

- Current and Planned Projects in Meyers:
 - Caltrans – Begin May 2014. Curb, gutter, basins, crosswalk.
 - County EIP – Erosion control project within ROW from Apache to San Bernardino.
 - CA State Parks – Golf course relocation and river restoration.
 - CTC – Campground restoration.
 - TTD – Request for CMAQ funds to connect East and West San Bernardino via a bicycle/pedestrian bridge.
 - Strategic Growth Council – TRPA is applying for funds for the mid-level planning of Meyers Corridor.
 - TRPA – On Our Way grant submittal for Meyers core mobility enhancements.
- Constraints:
 - Shallow ground water-design considerations
 - Caltrans right-of-way is not consistent (can go right up to the front door of businesses)
 - High Traffic Area
 - Polarized Community: some don’t want change
 - Misunderstandings around the Area Plan and its process
 - Topography – relatively flat
- Opportunities:
 - Opportunity to rethink business frontages. Linear road separate from Hwy 50 integrating cars, pedestrians, and bikes
 - County could take on portions of Caltrans right-of-way so better community planning can occur
 - BMPs are required on all Commercial Properties

- Focus BMP needs on existing large parking lots (Liras, Steve’s Transmission, Meeks, and Golf Course)
- Meyers Creek – currently takes urban run-off through the meadow. (Best case scenario = add pipe for storm-water conveyance from Lira’s side to meadow while Caltrans has road dug up for their project)
- Meadow Restoration – convey flows from commercial-core to meadow
- Public Lands - there are public parcels within the project area that may provide opportunities to enhance conveyance and detention
- Off-line linear option could include overflow with landscaping. There are property owners within the commercial-core that own more than one parcel. .

In addition to concept designs, the consultant team was asked to interview existing property and business owners within the Meyers commercial-core that represented properties that had either complied with BMP requirements or had not yet installed BMPs on their property(s). The purpose for the interviews was to gage the interest in supporting (both in concept and financially) the implementation of an area-wide BMP/stormwater system that would provide conveyance and treatment throughout the identified study area for both public and private properties. The interviews were conducted in March and April of 2014. The summary of those discussions are below.

Concurrent to the Tahoe RCD’s CWP effort in Meyers the Area Plan lead by El Dorado County and TRPA was nearing completion of a public draft. Both the content and the process of the Area Plan was questioned by the community, and during the summer of 2014 newspaper articles and public opinion seemed to suggest that the community was not interested in new development in Meyers. The controversy and skepticism of the Area Plan became a real constraint for implementing tasks planned for the CWP project, in fact the Tahoe RCD was asked by the County and TRPA to hold off from bringing the area-wide Strategies to the Advisory Council and the community.

At the third and final TAC meeting, it was decided that due to low support from business and property owners, coupled with topographic constraints for developing an area-wide system, the TAC agreed that pushing forward with the CWP project at this time could affect future opportunities to gain community support for area-wide stormwater treatment, and commercial-core upgrades.

Area-wide Stormwater Concept Plans

Two conceptual designs were developed by the consultant engineer and landscape architect. As noted above, the objective was to create two commercial-core design scenarios; the first simply addresses water quality improvements (Figure 4) and the second integrates water quality improvements with other elements that might bring additional value to property and business owners in the commercial-core (Figure 5).

Conceptual Plan #1 works within the existing Caltrans right-of-way providing “rain-garden” type depressions connected to treat and convey storm water to the meadow for final treatment. Plan #1 also includes a potential public parking site at the north end of the study area in the same location that the draft Area Plan identifies. This concept is mainly focused on areas that are publicly owned.

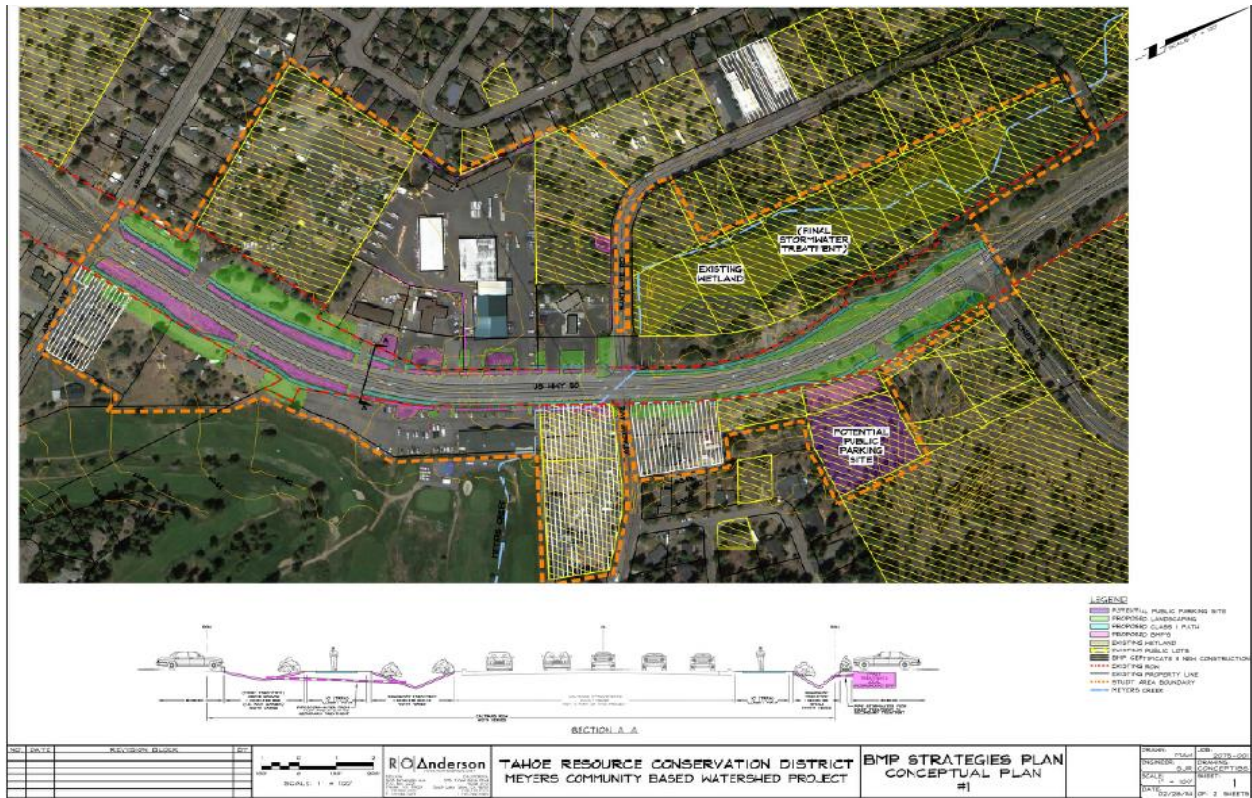


Figure 4. Meyers Study Area – Conceptual Plan #1

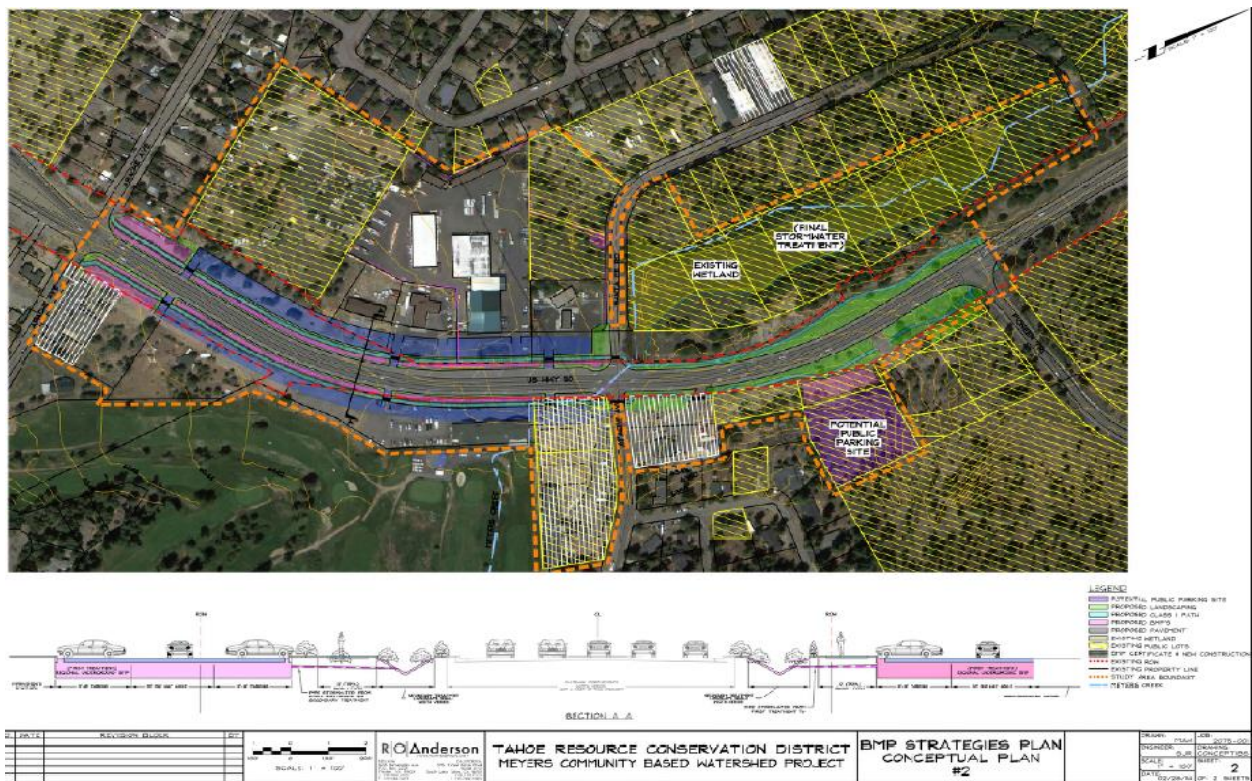


Figure 5. Meyers Study Area – Conceptual Plan #2

Conceptual Plan #2 works within the existing Caltrans right-of-way, within public lands, and on private property. Plan #2 includes improved circulation elements by adding a frontage “drive” along both sides of the highway. These one way frontage drives allow for additional diagonal parking that separates the auto movement from the pedestrian and bicycle movement. The landscaped “rain-garden” structure separates the pedestrian and bicycle movement from the traffic on the highway. Plan #2 also includes additional public parking in a parking lot at the north end of the study area. These designs were inspired by the information presented at several Meyers Community Meetings.

This work was also focused on presenting a model approach to developing a benefit assessment, or community facility district that could be used to support future stormwater projects or infrastructure in Meyers’ commercial core. In addition to the technical and planning services the Tahoe RCD provided to the Meyers Community and El Dorado County, the Tahoe RCD wanted to provide community outreach services to discuss with pivotal landowners how they envision the future Meyers commercial core functioning, and what amenities would make them more likely to cooperate with the County and TRPA on future Area Plan implementation.

MODELING RESULTS

The Lake Tahoe TMDL requires that Tahoe jurisdictions reduce pollutant loading of fine sediment particles (FSP), total nitrogen (TN), and total phosphorous (TP) to help improve water clarity in Lake Tahoe. The Pollutant Load Reduction Model v1.1 (PLRM) was developed as a tool to estimate pollutant load reduction to the lake based on the implementation of water quality improvement projects and management actions in a watershed. Using methods described in the Lake Tahoe Clarity Crediting Program Handbook (Crediting Handbook), pollutant load reductions are translated into Lake Clarity Credits used to track TMDL progress. Currently, Lake Clarity Credits are based on the amount of FSP load reduction to Lake Tahoe (the crediting program assumes if FSP is reduced TN and TP are concurrently reduced), therefore modeling results in this study focus solely on FSP load reductions. The objectives of the PLRMv1.1 modeling in this report are to 1) estimate the potential Lake Clarity Credits that could be obtained through traditional SFR BMP implementation in the Meyers area, and 2) estimate the potential Lake Clarity Credits that could be obtained through installation of area-wide BMPs in the Meyers Commercial Core. All PLRM models were established using the approach described in the PLRM user’s manual (NHC 2009).

PLRM Modeling: Single family Residential BMPs

Four catchments in the Meyers area (Figure 6) were modeled using PLRMv1.1 to determine potential Lake Clarity Credits that could be obtained through SFR BMP implementation. Acreage of each catchment, percent of the catchment that is single family residential, percent of single family residential land use that is impervious area, and the number of SFR parcels for each catchment is summarized in Table 1.

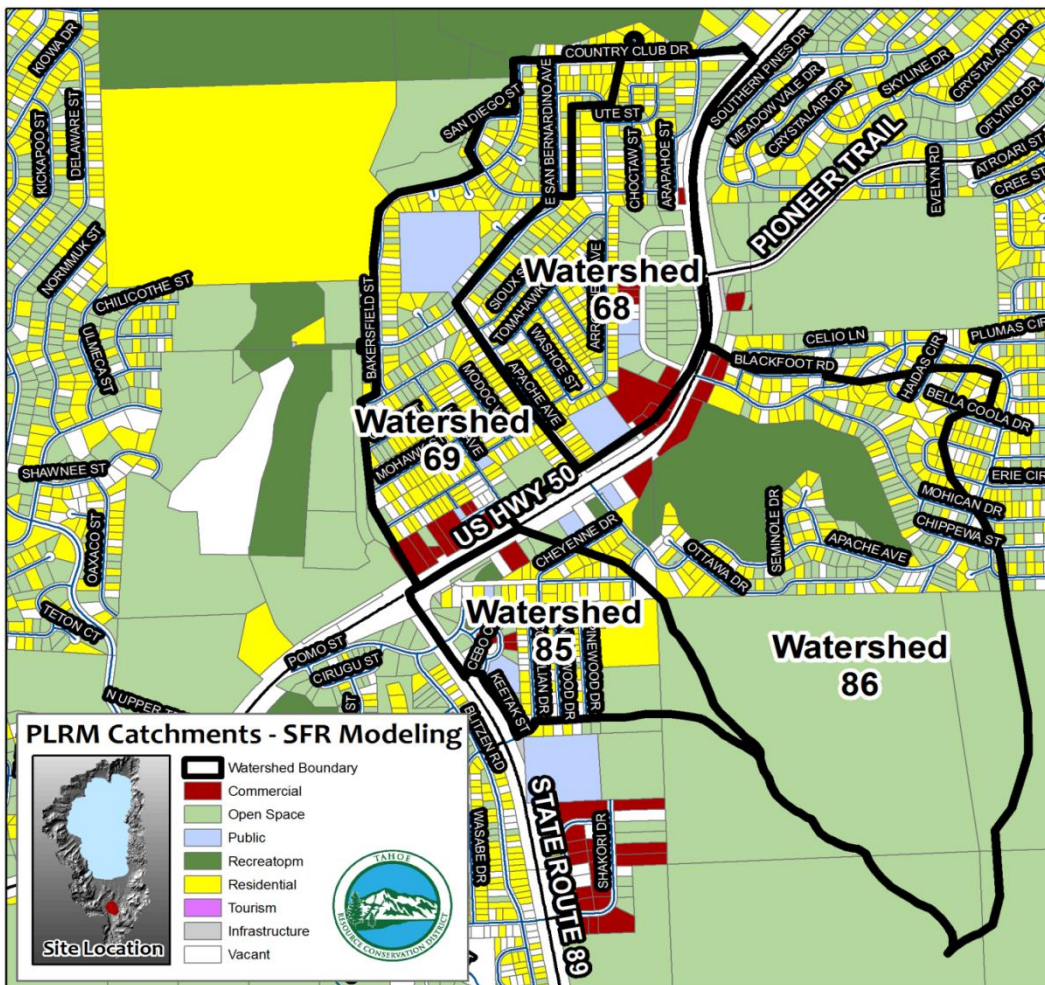


Figure 6. Catchment modeled with PLRM in the Meyers Study Area to estimate Lake Clarity Credits from SFR BMP implementation.

Table 1: Acres, total percentage SFR, percentage of single family residential that is impervious area, and number of SFR parcels for the watersheds modeled with the PLRM.

Meyers Watershed Characteristics				
	Watershed 68	Watershed 69	Watershed 85	Watershed 86
Acres	163	137	78	340
SFR %	34	40	34	11
SFR Impervious Area %	32	28	23	18
# of SFR parcels	259	229	95	147

In order to calculate the potential Lake Clarity Credits that could be obtained with SFR BMP implementation, PLRM models were run with SFR BMP compliance rates of 30 percent (the approximate compliance rate for the Tahoe basin), 50 percent, and 100 percent; all model results are summarized in Table 2. For reference, Table 3 shows the number of SFR parcels that would be necessary to achieve 30, 50, and 100 percent SFR BMP compliance in the Meyers area. The maximum number of credits that could be obtained with 100 percent SFR BMP compliance ranges from 0.68 to 1.61 for the four basins

modeled. The number of SFR BMP certificates necessary to achieve 100 percent SFR BMP ranges from 88 to 241 per watershed.

Table 2: Lake Clarity Credit potential for 30%, 50%, and 100% BMP compliance rates for the four Meyers catchments, determined through PLRM modeling.

Estimated Lake Clarity Credits - Calculated by PLRM				
SFR BMP Implementation	Watershed 68	Watershed 69	Watershed 85	Watershed 86
30%	0.34	0.39	0.17	0.21
50%	0.64	0.74	0.32	0.39
100%	1.39	1.61	0.68	0.84

Table 3: Number of SFR parcels at baseline and the number of parcels that would be required to achieve 30%, 50%, and 100% SFR BMP compliance.

Number of SFR parcels to achieve BMP compliance				
	Watershed 68	Watershed 69	Watershed 85	Watershed 86
30% SFR BMP compliance (# parcels)	60	53	22	34
50% SFR BMP compliance (# parcels)	111	98	41	63
100% SFR BMP compliance (# parcels)	241	213	88	137

PLRM Modeling: Area-Wide Stormwater Treatment

The Meyers commercial-core study area (Figure 7) was modeled using PLRMv1.1 to determine the potential Lake Clarity Credits that could potentially be obtained with the implementation of an area-wide stormwater treatment system. The area modeled covered 24.2 acres and is predominantly classified as commercial-industrial-communications-utilities (CICU) land use. Acreage of the area modeled, percent of the catchment that is CICU, percent of CICU that is impervious area, and the number of CICU parcels for the area modeled is summarized in Table 4 below. The PLRM model results estimate approximately 20 Lake Clarity Credits could be obtained through the implementation of area-wide treatment in the Meyers Commercial Core (Table 5).

Table 4: Acres, total percentage commercial-industrial-communications-utilities (CICU) land use, percentage of CICU that is impervious area, and number of CICU parcels for the area modeled with PLRM.

Meyers Commercial Core	
Acres	24.2
CICU %	65.0
CICU Impervious Area %	73.5
# of CICU parcels	14

Table 5: A conservative estimate of the number of Lake Clarity Credits that could be claimed through Area-Wide Treatment of the Meyers Commercial Core, as modeled with PLRM.

PLRM FSP modeling in the Meyers Commercial Core
Estimated Lake Clarity Credits (#)
19.8

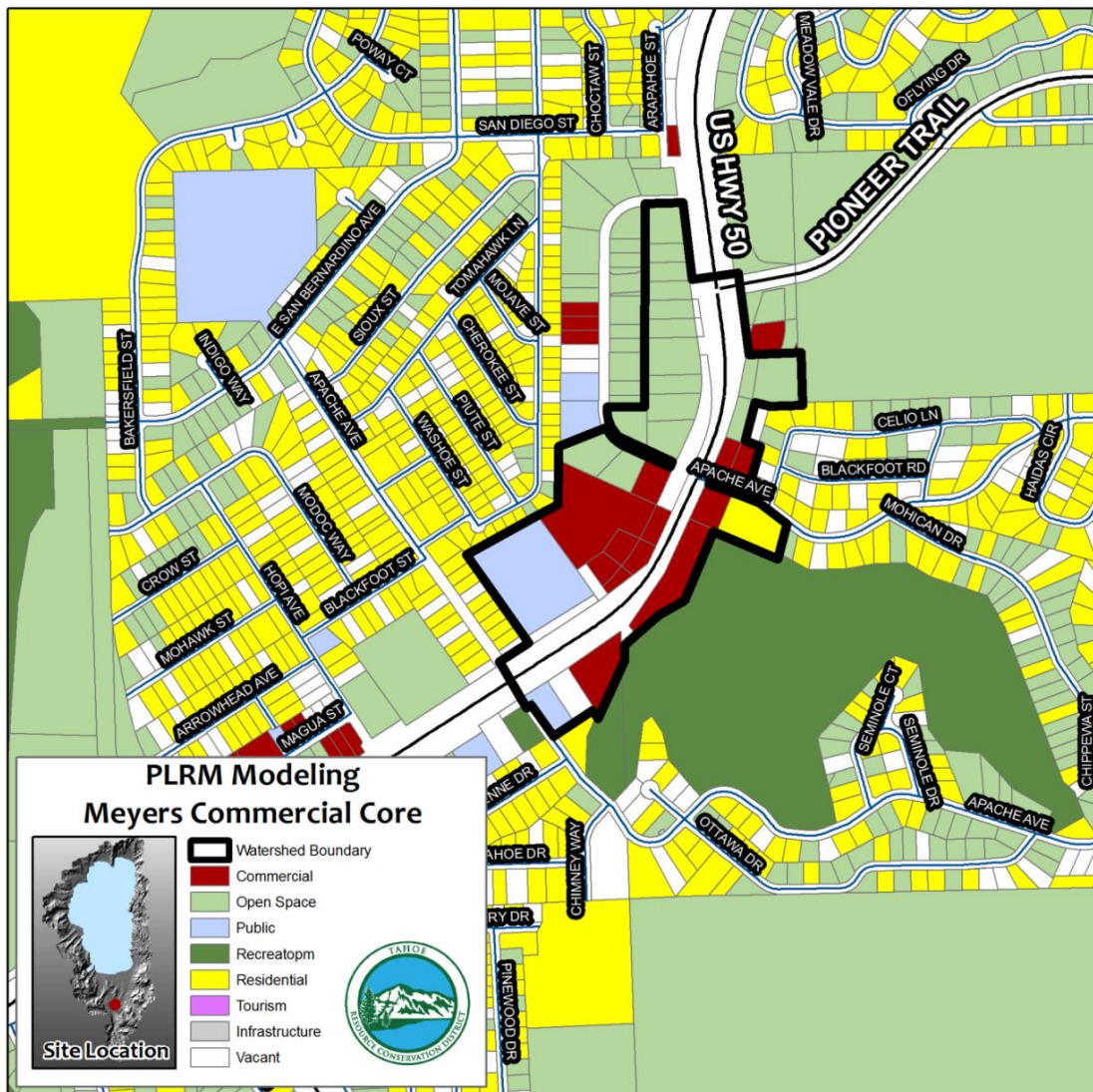


Figure 7. Meyers Commercial-Core modeled with PLRM.

PLRM Modeling: Discussion

This modeling exercise clearly demonstrates the advantages of a strategy that achieves BMP implementation in commercial corridors over individual SFR BMPs. The total number of Lake Clarity Credits that could be obtained through 100 percent SFR BMP implementation is approximately 4.5 credits, while an estimate of potential Lake Clarity Credits for area-wide treatment in the Meyers Commercial Core is approximately 20 credits; four times the amount of credits for 100 percent SFR BMP compliance. These numbers are not surprising in that the PLRM model assumes that pollutant loading from SFR parcels is relatively low when compared to commercial properties, and therefore much more credit can be gained through BMP implementation on commercial properties.

This study also illustrated the level of effort necessary to receive Lake Clarity Credits. Treating the commercial core is a much more efficient way to attain TMDL credits of course it would be necessary to get most of the CICU property owners on board with the plan, which would no doubt require a certain level of education and commitment. In contrast, to obtain 100 percent SFR BMP compliance would require between 88 to 241 BMP certificates *per catchment; approximately 750 in total*. Single family residential property owners have been slow to comply with the TRPA ordinance, and it would be no small task to achieve this goal.

Finally, implementation of the Lake Tahoe TMDL is still in its early stages and jurisdictions are focused on the most cost effective way to attain credits required by TMDL permits. In the future however, as credits become harder to obtain, jurisdictions may take a second look at how SFR BMPs can help them achieve their pollutant reduction goals.

These models have been built as a planning exercise to understand the potential credits that could be claimed with SFR BMP implementation versus Meyers commercial-core area-wide treatment. It should be noted that these models *should not be considered finalized estimates of Lake Clarity Credits for several reasons*. First, these models do not include stormwater infrastructure, as the plans are only in the concept phase. Additionally, these models were run using PLRM version 1.1; PLRM version 2.1, which will ultimately be used for catchment registration, is currently in beta testing and will be released in the Spring of 2015. Potential Lake Clarity Credits should not change substantially between PLRM version 1.1 and PLRM version 2.1.

BENEFIT ASSESSMENT – A CASE STUDY

In the 1995 Bijou/Al Tahoe Community Plan (a City of South Lake Tahoe and TRPA land use document), the Harrison Avenue project had been identified as an important capitol and environmental improvement project. In the preceding years there had been multiple attempts to design and implement a project in the Harrison Avenue commercial core. In December, 2011 the City of South Lake Tahoe's Council identified the Harrison Avenue commercial core improvements as its top priority project and hired a consultant team to design, engineer, obtain environmental clearance and permits, facilitate the formation of an assessment district, and provide public engagement. The key to the City Council's prioritization of this project was a timeline in which implementation would occur. The project, constructed in 2014, includes an area wide storm water system to improve water quality, streetscape, and mobility improvements.

Prior to the January 2012 project kick-off meeting, every property owner within the project area was contacted, interviews were conducted, and a personal invitation to the January kick-off meeting was extended. Of the fourteen private property owners, twelve owners or their representatives were in attendance. The first critical milestone achieved by this group was agreement on a design concept. This agreement led to preparation of the 20 percent engineered plans and a cost estimate. The engineer's cost estimate garnered more discussion about the design and what the property owners might be willing to finance as their fair share to implement the project. Assessment district best practices from other areas were presented.

Under the provisions of Proposition 218, property assessments may only charge for improvements that confer a special benefit to the property included in the district. This is based on the theory that the general public should not have to pay for the benefits that accrue to the few. The benefit analysis that was employed in the "fare" share calculations addressed the following:

- That an equitable method be used to identify the special benefit received from improvements.
- That all parcels receiving a special benefit, including publicly-owned parcels and utilities, had been identified and included in the district.
- The cost of the improvement had been reasonably apportioned among the benefitted parcels.
- Costs attributed to general benefits to the public at large (federally-owned parcels) were not paid from special assessments.

The amount of impervious surface on each parcel contributes storm water runoff to the area-wide BMP. With this in mind, owner costs were based on the amount of impervious land coverage existing and future potential for each parcel. Streetscape costs were calculated separately from the water quality improvements. The following four steps summarize the assumptions made in calculating the individual property owner water quality assessments:

1. Perform calculations for existing and build out scenarios for impervious land coverage for all private parcels and for the public's right of-way and parcels. This step provided a private/public ratio to be used in determining the private versus public share. Potential land coverage or built out scenarios were considered for two reasons: to assure the facilities built would have capacity to support runoff under future development conditions, and to insure the private property owners who had undeveloped or underdeveloped parcels would be assessed appropriately for future BMP needs. Impervious land coverage outside of the public right of way and parcels (for which a land survey was completed) was determined based upon Google Earth images.
2. Based on the engineer's estimate at the 50 percent design level, an impervious land coverage analysis was prepared that first identified the coverage ratio for public/private ownership.
3. There were three parcels within the project area that had already installed BMPs and the property owners did not feel they would gain a benefit from the water quality portion of the project. With a BMP certificate of completion from TRPA these three properties were excluded from the assessment calculations. With the above considerations, the private fare share per square foot of existing and potential land coverage was estimated..
4. A maximum of 50 percent land coverage was used in the individual private parcel calculations for undeveloped or underdeveloped parcels.

Streetscape improvement cost apportionments were similarly assigned. Although the improvements benefit the commercial properties directly in terms of enhancing their attractiveness and accessibility for customers, the Harrison Avenue improvements also create a general benefit to the City, its citizens, and visitors to the City by improving the attractiveness of the US Highway 50 corridor where it meets the lake front and providing on-street parking that will be used by visitors to the lake as well as to the commercial businesses. In reviewing the cost of the improvements in relation to the commercial value of the properties and the potential increase in business from the more attractive environment created by the improvements, it was determined that the special benefit conferred upon the property owners would not be more than half of the total cost of streetscape improvements in the area.

Most of the streetscape improvements are located on Harrison Avenue; however the project also included new alignments to incorporate diagonal parking, sidewalks and lighting on the side streets. The benefit assessment was calculated based on the amount of linear feet each parcel had on Harrison Avenue and the linear footage on a side street. It was negotiated that the benefit associated with the side streets was 25 percent that of the benefit gained from being on Harrison Avenue. As discussed above, the City deferred the assessments for residential and undeveloped parcels until such time as they develop into commercial uses.

The City agreed to a deferral of all assessments for undeveloped and residential parcels (there are two parcels with residences and four undeveloped parcels within the project area) and until which time the parcels are commercially developed. At such time the property owner will be responsible for the full assessment. This negotiated deferral was key to gaining support and passing the ballot vote by property owners which required, based on individual percent of assessment, at least 2/3s approval. Of the total amount assessed per parcel, the ballot vote for approval represented eighty-seven percent of the total assessment.

The successful progression of the Harrison Avenue project relied on the following planning elements:

- The City Council identified the implementation of this project as a high priority.
- An elected official and City administrator attended most of the advisory group meetings.
- Real time feedback, support and decision making allowed negotiations to move along quickly.
- A financial public-private partnership between the City and the property owners was key to moving this project forward.
- The process with the property owners was transparent and inclusive with room to negotiate.
- Public workshops informed the design and highlighted potential implementation issues.

The Harrison Avenue planning successes can be replicated at other locations around the Lake Tahoe Basin. Though each location is unique in its landscape and community character, economic and environmental values are similar. Commercial property owners at Lake Tahoe, in general, want to be seen as good environmental stewards of their property, contribute to their community's sustainability while insuring the viability of their own businesses and livelihood. In the process of building a public – private partnership the City of South Lake Tahoe provided strategic leadership and vision to move the project to construction. Replicating the Harrison Avenue public/private success in other places can happen when the property owners and community members trust their local leaders enough to make the investment in a vision that is shared.

MEYERS CWP - LESSONS LEARNED

In the commercial core areas around the Lake Tahoe Basin there is a need to provide a concentrated education effort focused on strategies for improving water quality. The efforts have to make it very clear what the potential benefits and values will be to a private property owner when they become a financial participant in an area-wide storm water project. Educating business and property owners about how implementing BMP's demonstrates good stewardship is not enough. The installation of BMPs on commercial properties cost tens of thousands of dollars if not hundreds of thousands of dollars.

From the planning and regulatory side it is important to be able to demonstrate the value a comprehensive storm water system can bring to a commercial district and the value it can add to individual property owners. For example, a large piece of commercial property may cost a half million dollars to adequately BMP individually, but as a partner in an area-wide system the property owner's contribution assessment could be less than half that cost. In addition, where usable space is a premium, a commercial property owner may find value in not needing to use parking space to install individual detention basins on site. In particular, when we are talking about commercial properties, systems that consider the integration of aesthetic enhancements, recreation benefits, parking and circulation improvements have a better chance of gaining investment (financially and politically) by commercial property owners.



Meyers Study Area – Looking West on US Highway 50 Across from Lira's Market.

On the other hand, for single family residences it is relatively less expensive to install BMPs. To ask the owner of a single family residence to pay more than a couple of thousand dollars into an assessment district in exchange for eliminating the requirement to install and maintain BMPs on the parcel will likely be challenging. An additional option for the Tahoe RCD and its stormwater partners is to explore an annual stormwater fee that would be relative to the average cost homeowners would pay to install BMPs, but spread out over a 40-50 year time frame. If implemented jurisdiction wide, stormwater

managers would have a consistent annual budget to commit to infrastructure maintenance and BMP replacement; providing a long-term and reliable community-based restoration approach.

In both cases however, either a neighborhood benefit assessment or a jurisdiction-wide assessment, approximately 30 percent of individual private property owners on the California side of the Lake Tahoe Basin have already complied with TRPA's ordinance and installed BMPs. Although maintenance is an ongoing burden, these property owners would be less likely to volunteer to be financial partners in area-wide storm water projects.

NEXT STEPS AND RECOMMENDATIONS

One of the perceived benefits to working with the Meyers community is there was an established planning group (Meyers Community Advisory Council) working toward the adoption of the Meyers Community Area Plan. Like with anything however, timing is critical. Although the Tahoe RCD was successful at getting the area-wide stormwater treatment concept included in the Area Plan project list; there can be drawbacks to introducing another element, particularly an implementation element, if there are on-going concerns from the community about the plan as a whole.

In order to continue our efforts in Meyers, the Tahoe RCD will stay connected to the community by providing continued Landscape Conservation education and technical services where possible. We are also in the process of partnering with El Dorado County and the Lake Tahoe Environmental Magnet School to develop a rain-water harvest system that would serve as an innovative demonstration project to help highlight community stormwater projects and water conservation initiatives. The Tahoe RCD is also in the process of identifying grant opportunities that would assist with planning and implementing meadow restoration along Meyers Creek that would provide benefits to recreation, wildlife, water quality and aesthetics. By taking a leadership role in supporting conservation issues within the Meyers community the Tahoe RCD and partner agencies can gain the trust of the community to ensure synergy with future collaborative endeavors.

Recommendations for Future Area Plan Collaboration:

- Participants in the planning and design stages should be identified and engaged as early as possible in the process. Participants need to include: decision makers, property owners, agencies with jurisdiction. Others to consider early in the process are utility providers, Caltrans, and potential funding agencies.
- If a financial partnership between public and private entities is a goal, the establishment of what the decision space will be (consensus, vote, public entity makes decision, etc.) is critical.
- Include an expert on assessment districts on the team who will clearly articulate financial requirements and opportunities under the law.
- Transparency is a critical piece to building trust and moving a process forward that depends on buy-in from property owners.

REFERENCES

Watershed Assessment. USFS Forest Service, 2000.
Lake Tahoe Technical TMDL. Lahontan and NDEP, 2010.
Meyers Area Plan. El Dorado County, 2014.
Pollutant Load Reduction Model (PLRM) User's Manual. NHC, December 2009.
PLRM Quality Assurance Project Plan. Tahoe RCD, 2014.

ATTACHMENTS

Attachment A – Tahoe RCD Technical Services Provided in 2014
Attachment B – Community Survey Results

ATTACHMENT A

Technical Assistance

Count	APN	Street Address	Service Requested	Service Date	Grant Charged	Community Name	CWP?
1	2530310	1507 BLACKBART AVE	Revised evaluation	5/9/2014	EPA CWP	Black Bart	non CWP
2	8014405	1041 TURNBACK TRL	BMP Evaluation Mailed: Regular Evaluation	5/22/2014	EPA CWP	Golden Bear	non CWP
3	8017502	3050 SOURDOUGH TRL	Turf Conversion	4/18/2014	EPA CWP	Golden Bear	non CWP
4	8014405	1041 TURNBACK TRL	BMP Evaluation	4/10/2014	EPA CWP	Golden Bear	non CWP
5	3454105	1948 KICKAPOO ST	Conservation Landscaping-reveg alt to turf	4/14/2014	EPA CWP	Tahoe Paradise	non cwp
6	028-190-026	3826 REGINA RD	BMP Assistance: Home Owner	4/8/2014	EPA CWP	Ski Run- North	non CWP
7	023-611-007	877 JULIE LN	BMP Assistance: Home Owner	5/27/2014	EPA CWP	Y area	non CWP
8	026-122-040	704 EL DORADO AVE	Sustainable Turf	4/30/2014	EPA CWP	Al Tahoe	non CWP
9	025-193-025	1454 HERBERT AVE	Conservation Landscaping	6/3/2014	EPA CWP	Ski Run- South	non CWP
10	026-095-017	3046 BERKELEY AVE	Final Inspection: passed	4/30/2014	EPA CWP	Al Tahoe	non CWP
11	8008211	1877 IBACHE ST	BMP Evaluation Mailed: Regular Evaluation	5/20/2014	EPA CWP	Apalachee	non CWP
12	3654311	3459 S UPPER TRUCKEE RD	BMP Assistance: Homeowner	5/16/2014	EPA CWP	Christmas Valley	
13	3409718	1920 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
14	3410105	1857 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
15	3409702	1858 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	

16	3409704	1870 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
17	3409705	1876 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
18	3410101	1879 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
19	3411201	1883 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
20	3411204	1891 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
21	3411206	1899 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
22	3410106	1851 BELLA COOLA	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
23	3409508	1911 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
24	3409703	1864 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
25	3409507	1917 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
26	3422203	1652 CHOCTAW ST	BMP Evaluation Mailed: Rapid Soils Packet	5/31/2014	EPA CWP	Meyers	
27	3422203	1652 CHOCTAW ST	Issued Materials - (Home Landscaping Guide)	5/10/2014	EPA CWP	Meyers	
28	8107405	1571 TIONONTATI ST	BMP Evaluation	5/5/2014	EPA CWP	Meyers	
29	3471319	1780 CHIBCHA ST	BMP Assistance: Contractor	4/17/2014	EPA CWP	Meyers	
30	3409714	1910 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
31	3409904	1613 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	

32	3412131	1528 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
33	3412305	1543 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
34	3412303	1581 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
35	3412120	1588 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
36	3412311	1601 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
37	3412118	1602 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
38	3412117	1608 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
39	3410102	1873 BELLA COOLA DR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
40	3412301	1609 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
41	3409903	1619 SITKA CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
42	3409711	1493 PLUMAS CT	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
43	3409602	1517 PLUMAS CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
44	3422203	1652 CHOCTAW ST	BMP Evaluation	5/10/2014	EPA CWP	Meyers	
45	3409804	1522 PLUMAS CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
46	3409202	1620 PLUMAS CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
47	3412112	1554 PLUMAS CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	

48	3412206	1543 PLUMAS CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
49	3412207	1537 PLUMAS CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
50	3412208	1529 PLUMAS CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
51	3412116	1528 PLUMAS CIR	BMP Evaluation Mailed: Rapid Soils Packet	6/3/2014	EPA CWP	Meyers	
52	3349402	1605 GRIZZLY MOUNTAIN DR	BMP Evaluation Mailed: Regular Evaluation	5/9/2014	EPA CWP	Tahoe Paradise	
53	3324605	1037 BOULDER MOUNTAIN CT	Final Inspection: passed	5/31/2014	EPA CWP	Tahoe Paradise	
54	3324605	1037 BOULDER MOUNTAIN CT	BMP Evaluation Mailed: Regular Evaluation	5/1/2014	EPA CWP	Tahoe Paradise	
55	1515416	7133 7TH AVENUE	BMP Evaluation	4/11/2014	EPA CWP	Tahoma	
56	1532501	7116 WILSON AVE	BMP Driveway	4/11/2014	EPA CWP	Tahoma	
57	1515416	7133 7TH AVENUE	BMP Evaluation Mailed: Regular Evaluation	5/20/2014	EPA CWP	Tahoma	
58	1532501	7116 WILSON AVE	BMP Evaluation - Driveway	4/11/2014	EPA CWP	Tahoma	

ATTACHMENT B

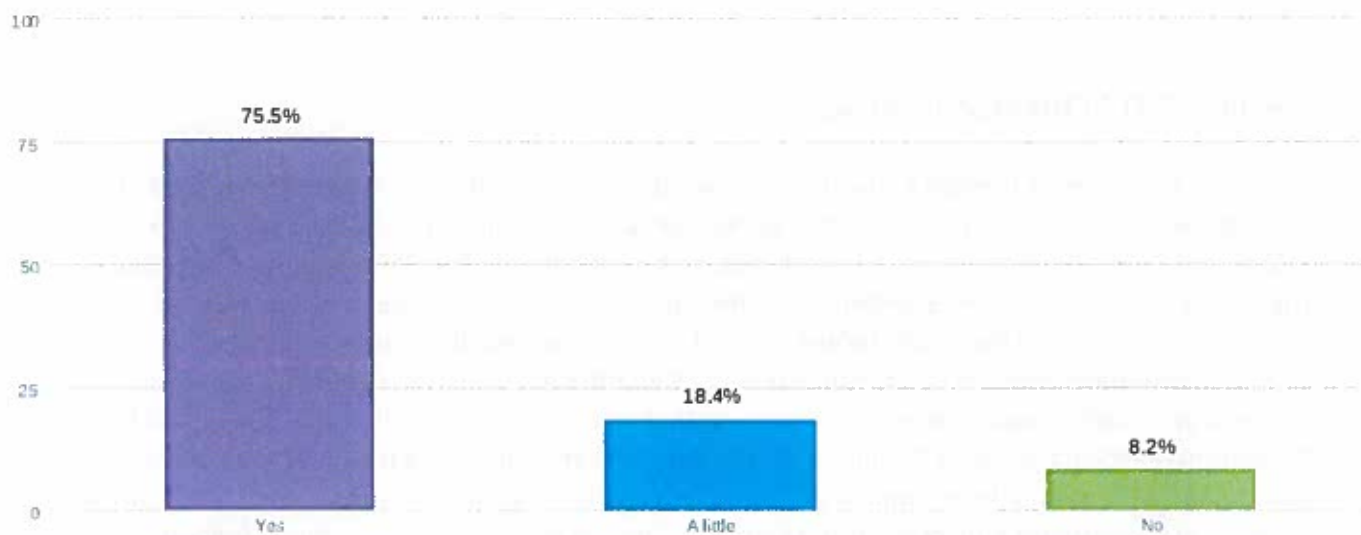
Results - 2014 Community Survey




District staff gathered feedback through community surveys in 2014. Surveys were provided through newsletter links, mailers, and in person at select community events. Through this effort, community members were introduced to the role of pollutants in water quality decline, the Tahoe RCD's role in conservation education and technical assistance, and were asked questions to help the Tahoe RCD better understand the communities knowledge and willingness to participate in basin-wide conservation efforts including supporting area-wide stormwater BMPs. Forty-nine people participated in the survey and the results revealed that 75% of the participants were familiar with the term Urban Runoff and how it affects water quality and 67% would be in support of finding alternative ways to tradition parcel level BMPs to assist in stormwater collection and treatment. The full survey summary report follows.

2014 Tahoe Community Survey Report

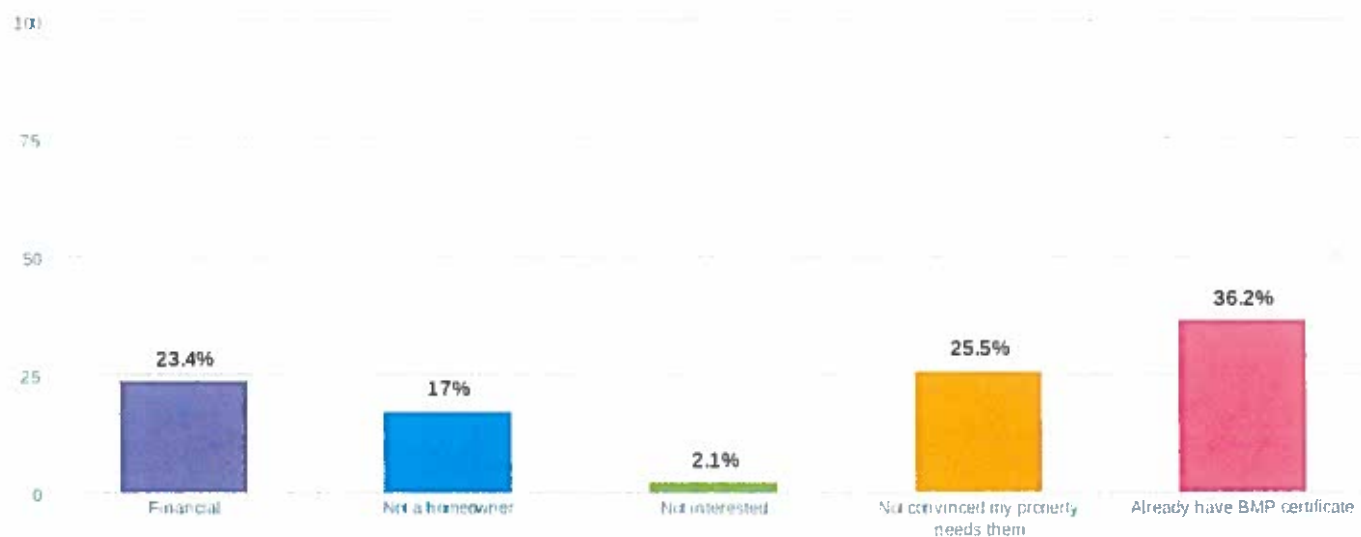
Survey 3 Lake Tahoe 2014 Community Survey

1. Are you familiar with the term Urban Stormwater Runoff and how it effects water quality?

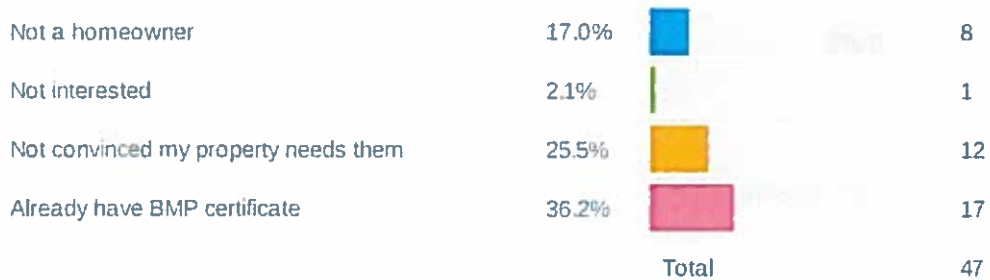


Yes	75.5%		37
A little	18.4%		9
No	8.2%		4
Total			49

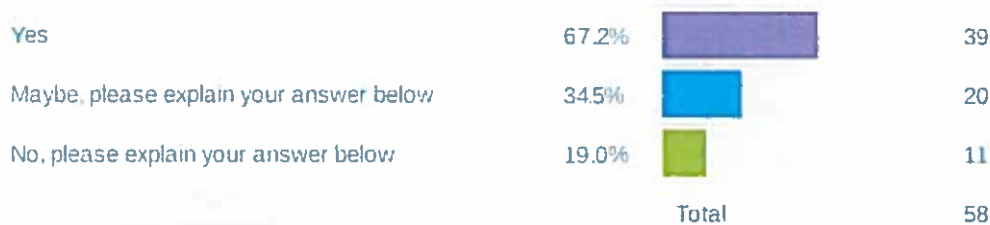
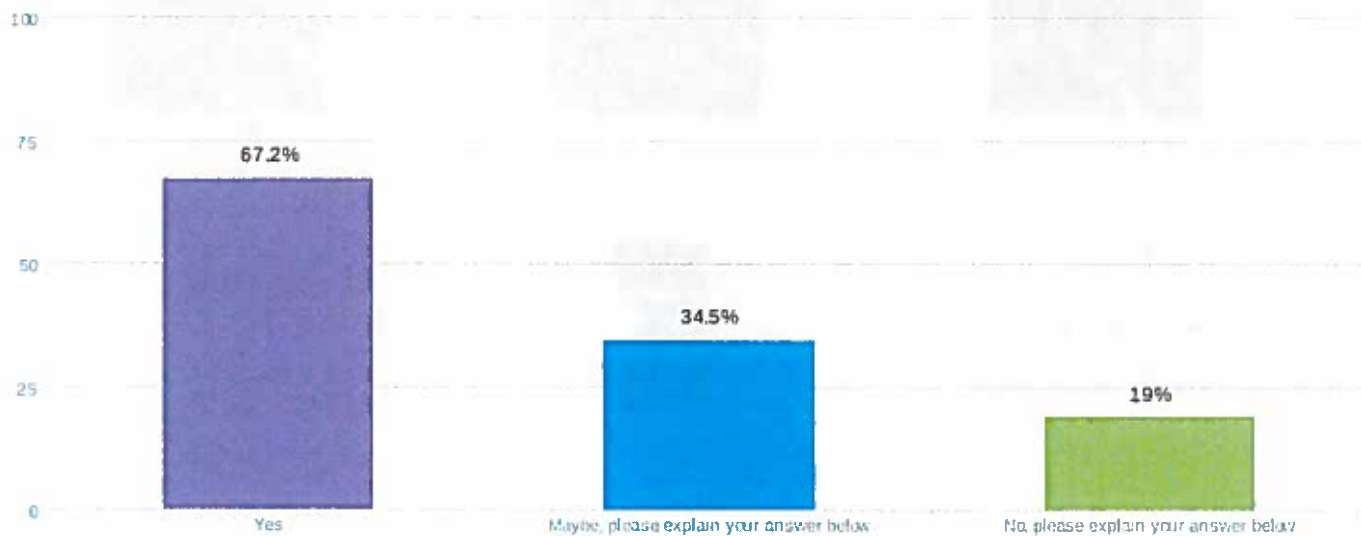
2. What reason(s), if any, has prevented your BMP implementation?



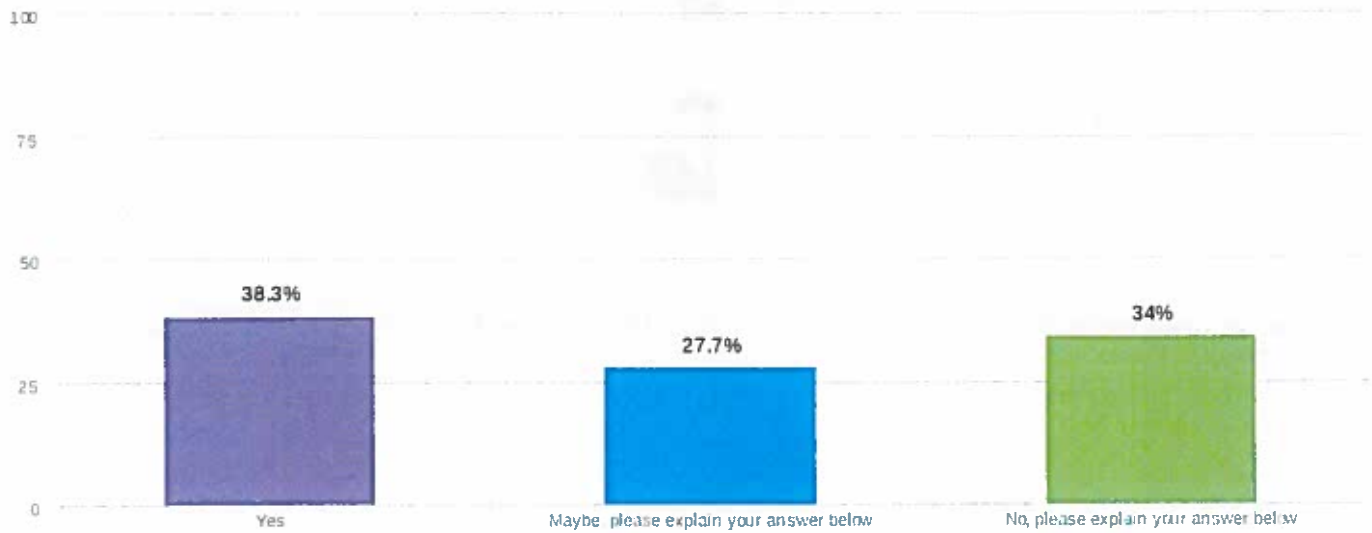
Financial	23.4%		11
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3. Would you support finding alternative ways to traditional parcel level BMPs to assist in stormwater collection and treatment?

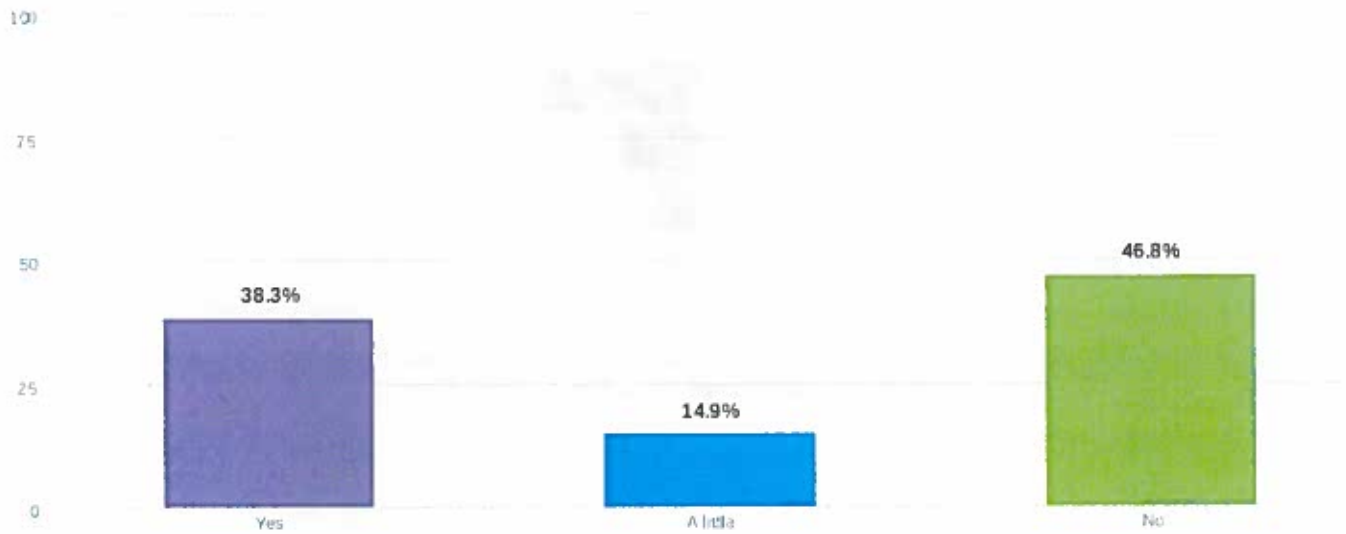


4. Would you be interested in participating in a Tahoe RCD Lake Friendly Landscaping Program to assist property owners in lake friendly landscaping practices including sediment control measures?



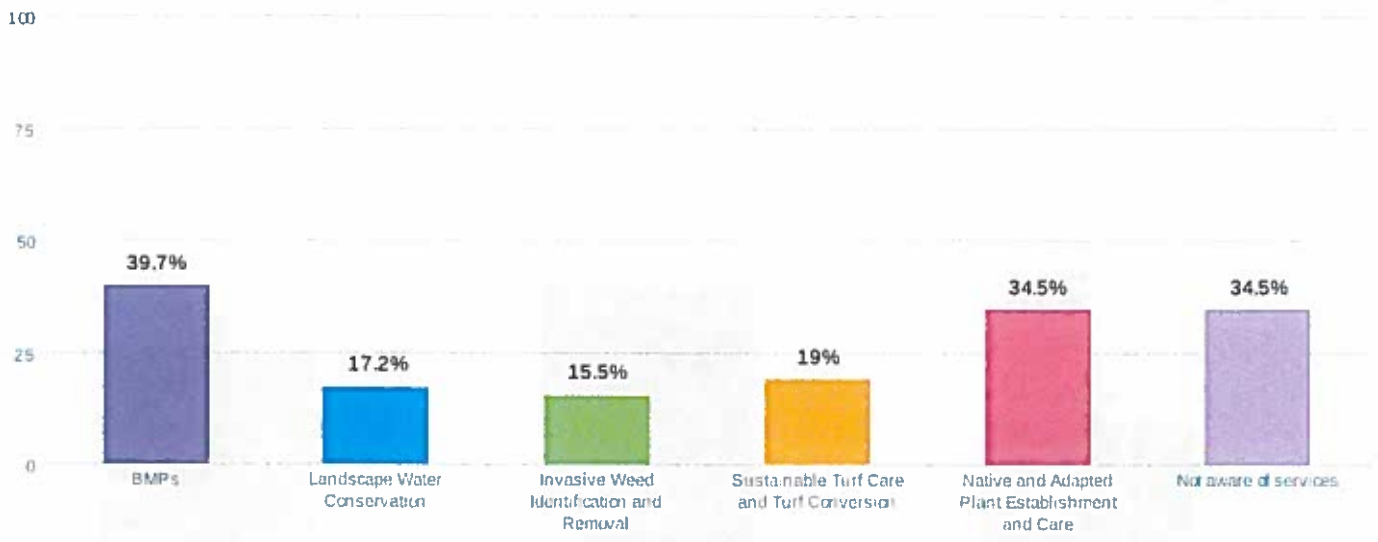
Yes	38.3%	18
Maybe please explain your answer below	27.7%	13
No please explain your answer below	34.0%	16
Total		47







5. Are you familiar with the term Source Control BMPs?



Yes	38.3%	18
A little	14.9%	7
No	46.8%	22
Total		47

6. Please indicate, if any, which technical assistance services you have requested from Tahoe RCD?



BMPs	39.7%		23
Landscape Water Conservation	17.2%		10
Invasive Weed Identification and Removal	15.5%		9
Sustainable Turf Care and Turf Conversion	19.0%		11
Native and Adapted Plant Establishment and Care	34.5%		20
Not aware of services	34.5%		20
Total			58

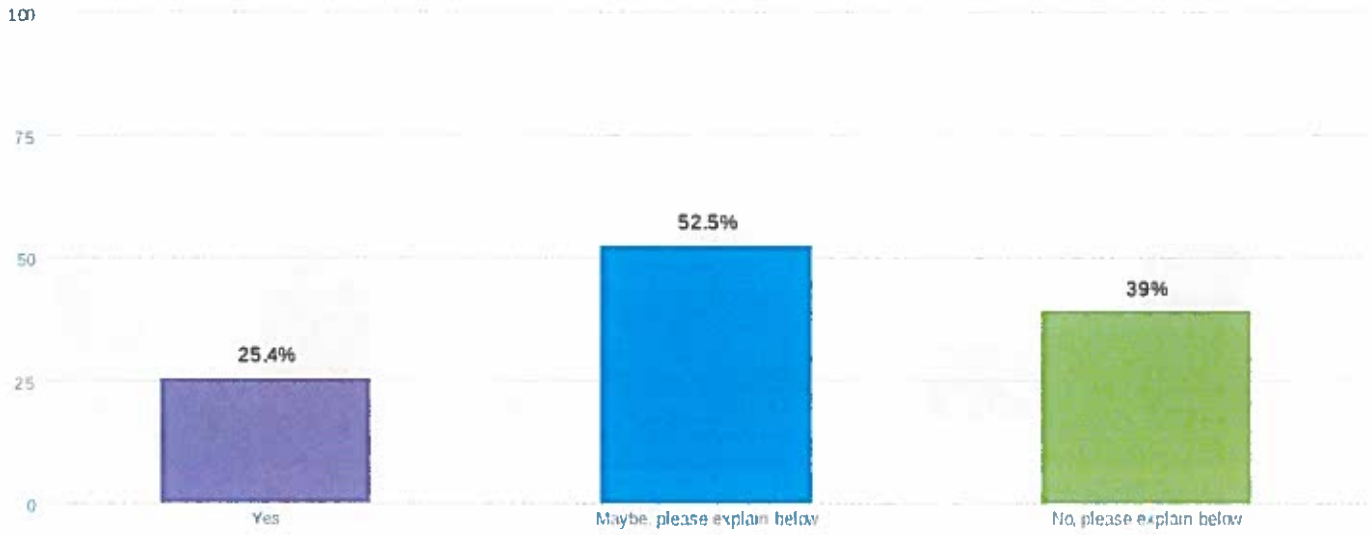
7. Please rank your main natural resource concerns from most important to least important




	Score*	Overall Rank
Mid-lake Clarity	336	1
Wildfire	306	2
Near-shore Conditions	302	3
Forest Health	298	4
Aquatic Invasive Species Management and Control	293	5
Scenic Values	249	6
Terrestrial Invasive Species	226	7
Invasive species	198	8
Other, please write below	94	9

Total Respondents 64

* Score is a weighted calculation. Items ranked first are valued highest and on the following ranks, the score is the sum of all weighted rank counts.

8. When funding for assistance is limited, would you be willing to pay for technical assistance services from the Tahoe RCD?



Yes	25.4%		15
Maybe, please explain below	52.5%		31
No, please explain below	39.0%		23
Total			59