LAKE TAHOE TMDL PROGRAM:

2014 PERFORMANCE REPORT

Guiding Efforts to Restore Lake Tahoe's Historic Clarity

FOREWORD

Lake Tahoe's clarity can be restored. Scientific research tells us that it is possible for people to once again be able to see to depths of close to 100 feet in Lake Tahoe. We, the California Regional Water Board, Lahontan Region (Lahontan Water Board) and Nevada Division of Environmental Protection (NDEP) are committed to the Lake Tahoe Total Maximum Daily Load (TMDL), a strategy to return Lake Tahoe clarity to a depth of nearly 100 feet. Although Lake Tahoe clarity has been in decline for nearly a half of century, it has shown signs of stabilization over the past decade. This good news is partly in response to the water quality improvements implemented by federal, state, local and private partners around the Tahoe Basin. Science indicates that increasing the number and efficacy of these and other types of water quality improvement efforts are key to achieving lake clarity goals.

The *2014 TMDL Performance Report* provides a high-level summary of TMDL implementation efforts. The report summarizes the most compelling accomplishment information, provides a brief trend analysis for each TMDL source category and highlights water quality improvement projects of interest. Accomplishment information contained in the report is a compilation of the data for projects implemented between 2004 and 2013. In the future, this report will be released annually, providing an update of TMDL implementation accomplishments from the past year. Regular reporting of accomplishments facilitates transparency, demonstrates accountability and helps retain support for the expenditure of public funds on water quality improvements.

We are encouraged by the accomplishments presented in this report. Landowners around the Tahoe Basin have shown a consistent drive to implement water quality improvement projects and have shown initiative in moving projects forward. Sustained, additional effort is needed to meet lake clarity goals, and we are dedicated to working with landowners to identify and implement the most efficient and cost effective water quality improvements and to find new and unique ways to track and report these efforts.

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INTRODUCTION

The *2014 TMDL Performance Report* presents data collected from TMDL Implementers on water quality projects implemented between 2004 and 2013. 2004 is the TMDL baseline year during which pollutant loading estimates from each source category were calculated. Accomplishment information contained in the report is a compilation of the data submitted annually to the Lahontan Regional Water Quality Control Board (Lahontan Water Board) and Nevada Division of Environmental Protection (NDEP) by TMDL Implementers. TMDL Implementers take actions to improve Lake Tahoe clarity throughout the year and report on these various actions - from street sweeping to stream restoration. TMDL Implementers include California and Nevada local governments, state highway transportation departments (collectively referred to as Urban Jurisdictions), as well as state, federal and regional land and natural resource management agencies. Accomplishment data is summarized and presented in a series of charts that are organized by the TMDL pollutant source categories: Urban Uplands, Forested Uplands, Stream Channel Erosion and Atmospheric Deposition. The Forested Uplands, Stream Channel Erosion, and Atmospheric Deposition source categories are collectively referred to as the Non-Urban Source Categories. The Forested Uplands source category is further aggregated into subcategories, or "settings" due to its size and the diversity of landscapes it encompasses. These subcategories include Forest Roads, Disturbed Areas, and Facilities. The report summarizes the most compelling accomplishment information, provides a brief trend analysis for each source category and highlights water quality improvement projects of interest.

Urban Uplands Source Category

For this report, a qualitative summary of accomplishments for the Urban Uplands Source Category is provided, as urban jurisdictions have not yet reported load reductions for their water quality improvement actions. Urban Jurisdictions have taken initial steps to make load reduction tracking and reporting possible and will report load reduction accomplishments when available in 2016. In future versions of the *TMDL Performance Report*, accomplishments for the Urban Uplands Source Category will be provided as estimated average annual fine sediment particle, nitrogen, and phosphorus load reductions along with the associated Lake Clarity Credit awards.

Non-Urban Source Categories

Activities to address water quality in the Non-Urban Source Categories are tracked using a set of six TMDL performance measures (TMDL PMs) that quantify the miles, acres, feet and number of facilities on or for which activities are undertaken. This approach does not include load reduction estimates, but rather provides the extent of activity implementation. The six TMDL PMs were selected based on their relevance to lake clarity, their alignment with existing reporting efforts in the Tahoe Basin, and the feasibility of data collection.

TMDL ONLINE INTERFACE

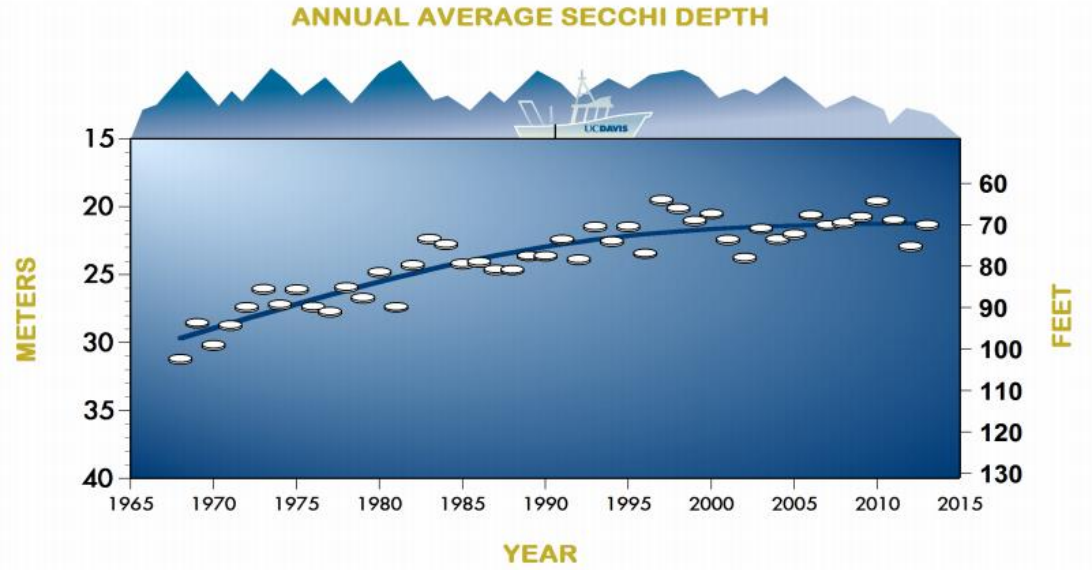
The *2014 TMDL Performance Report* compliments accomplishment information published on the *TMDL Online Interface*. The *TMDL Online Interface* is the central hub for information on the Lake Tahoe TMDL and the associated management of the TMDL Program. The *Online Interface* provides specific details of TMDL accomplishments including pollutant load reductions achieved in the Urban Uplands (once available) and TMDL-related water quality improvements implemented by land and natural resource management agencies in the non-urban source categories.

Visit the TMDL Online Interface:
www.enviroaccounting.com/TahoeTMDL/Program/Home

LAKE TAHOE CLARITY

The Lake Tahoe TMDL was developed to improve Lake Tahoe's deep water clarity. Water clarity is measured with a Secchi disk—a circular, white disk that is lowered slowly in the water. The depth the disk is no longer visible is recorded as the Secchi depth. Standardized methods for measuring Secchi depth at Lake Tahoe have been applied since the late 1960s by UC Davis, Tahoe Environmental Research Center. Measurements are generally taken every 7-10 days and the annual average Secchi disk depth is reported in the annual *State of the Lake Report.*

Over time, significant reductions in fine sediment and nutrient pollutant loading to Lake Tahoe through implementation of water quality improvement actions should show a clear correlation to improvements in lake clarity. It is still too early to analyze any relationship between lake clarity and TMDL implementation, however, the Lahontan Water Board and NDEP are encouraged by a decade long trend of Secchi depth stabilization. The average annual clarity of Lake Tahoe in 2013 was 70.0 feet (21.3 m). This is within 10 feet of the 2031 interim clarity target of 78 feet.



For more information on the Annual State of the Lake Report visit UC Davis Tahoe Environmental Research Center Website: **http://tahoe.ucdavis.edu/stateofthelake/**

URBAN UPLANDS SOURCE CATEGORY

Lake Tahoe TMDL research identifies fine sediment particles (FSP) less than 16 microns in diameter as the greatest contributor to lake clarity decline and stormwater runoff from the Urban Uplands as the primary source of FSP pollution. Urban stormwater runoff was found to contribute 72 percent of the total FSP load entering Lake Tahoe. This section highlights activities taken by Urban Jurisdictions to improve lake clarity and identifies additional steps that will be taken over the coming years to account for load reduction accomplishments in the Urban Uplands Source Category.

Urban Jurisdictions implement pollutant load reduction actions throughout the year. These include pollutant and hydrologic source controls such as street sweeping and infiltration facilities and stormwater treatment best management practices (SWT BMPs) such as cartridge filters. To support prioritization and implementation of the most effective controls to reduce FSP loading from urban stormwater runoff, Lahontan Water Board and NDEP, developed the Lake Clarity Crediting Program (Crediting Program). The Crediting Program uses standardized tools and protocols to consistently and transparently estimate, account and report FSP load reductions achieved through implementing water quality improvement actions.

URBAN JURISDICTIONS

California Department of Transportation (Caltrans)
City of South Lake Tahoe
Douglas County
El Dorado County
Nevada Department of Transportation (NDOT)
Placer County
Washoe County

Urban Jurisdictions use a continuous simulation water quality model, the Pollutant Load Reduction Model (PLRM), developed as part of the Crediting Program to estimate pollutant load reduction potential associated with implementation actions, and use established condition assessment protocols to annually verify that actual on-the-ground conditions are representative of the modeled condition. They register load reduction estimates, report condition assessment results, and declare credits in *Annual Stormwater Reports* submitted in accordance with applicable National Pollution Discharge Elimination System permits (NPDES) permits and Inter-Local Agreements.

Accomplishments

Urban Jurisdictions continue to implement water quality improvements and are carrying out steps to meet the 2016 load reduction milestone established by the Lake Tahoe TMDL and further defined by California National Pollutant Discharge Elimination System (NPDES) stormwater permits and Nevada Interlocal Agreements (ILAs). As of September 2014, all Urban Jurisdictions have submitted load reduction plans that were either approved by the Lahontan Water Board or are awaiting approval by NDEP. These plans detail how each jurisdiction intends to reduce pollutant loading of fine sediment particles by 10 percent, phosphorus by 7 percent and nitrogen by 8 percent from their 2004 baseline.

TMDL Program Managers have been working with Urban Jurisdictions to identify and carry out priority improvements to the stormwater tools used by the Crediting Program. Beta testing of these updated tools will be initiated in the fall of 2014 with a full set of new tools available by June 2015. In addition, a Road Operations Testing project is underway that is assessing the cost-effectiveness of implementing various roadway operations and maintenance practices and the associated expected achievable roadway conditions.

Looking Forward

In 2015 Urban Jurisdictions will use the updated stormwater tools to implement the Crediting Program. For SWT BMPs this includes: establishing benchmark and threshold values for key and essential SWT BMPs to define acceptable performance levels and set maintenance standards; assessing the existing condition of these SWT BMPs; and performing needed maintenance to restore function to existing SWT BMPs. For road operations and maintenance, initial work includes evaluating effectiveness of and expected roadway conditions related to various road operation practices.

In March 2016 Urban Jurisdictions will submit their first annual stormwater reports that will include quantitative load reduction estimates in accordance with the Crediting Program. Based on progress to date, TMDL Program Managers anticipate these reports will confirm achievement of the first TMDL milestone, a 10 percent reduction of FSP from each Urban Jurisdiction. Future *TMDL Performance Reports* will include a graphical display of load reduction accomplishments for each Urban Jurisdiction.

NON-URBAN SOURCE CATEGORIES

The three non-urban source categories: Forested Uplands, Stream Channel Erosion and Atmospheric Deposition, collectively contribute 28 percent of the total FSP load, 71 percent of the total nitrogen load, and 43 percent of the phosphorus load entering Lake Tahoe. Nine percent of this FSP load originates in runoff from the Forested Uplands, 4 percent from Stream Channel Erosion and 15 percent from Atmospheric Deposition. This section highlights activities and associated accomplishments that reduce pollutant loading from the non-urban source categories.

Local, state and federal natural resource management agencies and their partners perform various multi-objective land management activities throughout the year, including actions to reduce runoff volumes and improve surface water quality. The Lake Tahoe TMDL indicates continued implementation of these activities will effectively achieve established load reduction targets for the non-urban source categories. Activities to address water quality in the non-urban source categories are tracked using a set of six TMDL performance measures (TMDL PMs) that quantify the miles, acres, feet and number of facilities on or for which activities are undertaken. The six TMDL PMs were selected based on their relevance to lake clarity, their alignment with existing reporting efforts in the Tahoe Basin, and the feasibility of data collection.

NATURAL RESOURCE MANAGEMENT AGENCIES & PARTNERS

California State Parks (State Parks)

California Tahoe Conservancy (CTC)

Diamond Peak Ski Resort (Incline Village General Improvement District - IVGID)

Heavenly Mountain Resort (Heavenly)

Homewood Mountain Resort (Homewood)

Nevada Tahoe Resources Team (NTRT)

U.S. Forest Service Lake Tahoe Basin Management Unit (USFS LTBMU)

The data presented in this section represents the best estimate of annual water quality improvement activities undertaken in the Forested Uplands and along Stream Channels since 2004. The data provides the basis to compare the extent of water quality improvement activities undertaken in the non-urban source categories in future years. Each TMDL PM is displayed in a series of charts that highlight annual activity accomplishments. Also provided are featured projects that describe, in more detail, projects that have made significant progress in reducing pollutant loading from the non-urban source categories. TMDL PMs are organized in this report by individual source category, with additional subcategories for the Forested Uplands.

Forested Uplands

The vast majority of the pollutant loading from the forested uplands originates on forest roads, disturbed areas and public facilities.

- **Forest Roads** generate more sediment on a per acre basis than any other resource category in the Forested Uplands. As water washes over forest roads it picks up nutrients and particles, and deposits them into nearby surface waters that drain to Lake Tahoe.
- **Disturbed Areas** are areas with compacted soil, disturbed vegetation and/or impacted hydrology, such as ski runs and recreational areas. Restoring and enhancing disturbed areas increases stormwater infiltration and reduces pollutant loading to surface waters.
- Retrofits on **public facilities** reduce stormwater runoff and capture particles and nutrients before they enter nearby surface waters. Facility retrofits represent good management and caretaking by land managers in the Forested Uplands.

Stream Channel Erosion

Stream channel restoration and enhancement reduces pollutant inputs from failing stream banks and eroding stream beds, and helps reconnect disturbed rivers and streams with the natural floodplain, enabling the stream system to serve as a natural filter for pollutants. TMDL reporting focuses on restoration and enhancement activities implemented on the three streams responsible for the majority of pollutant contributions from Stream Channels in the Tahoe Basin: The Upper Truckee River, Blackwood Creek and Ward Creek. Collectively these streams contribute 96 percent of the FSP loading from the Stream Channel Erosion Source Category.

Research completed since 2010 indicates that restoring floodplain connectivity and geomorphic function in riverine systems may provide significant FSP load reductions. The extent of these findings will likely be improved in subsequent years as a new model, the Stream Load Reduction Tool (SLRT), becomes more widely used to estimate pollutant load reductions achieved through stream restoration projects.

Atmospheric Deposition

Atmospheric deposition contributes 15 percent of the total FSP load, 15 percent of the total phosphorus load, and 55 percent of the total nitrogen load entering Lake Tahoe. Currently, there is no TMDL PM specific to reducing FSP from atmospheric deposition. The strategy for reducing FSP and phosphorus contributed from atmospheric deposition calls for reducing the amount of dust from parking lots, construction sites, and roadways through activities including street sweeping with advanced vacuum sweeping equipment, and paving or eliminating dirt roads. Mobile sources, such as automobiles, buses, and boats, predominantly produce nitrogen, not fine sediment particles or phosphorus. The strategy for reducing nitrogen generated within the Lake Tahoe Basin relies on the Tahoe Regional Planning Agency's (TRPA) air quality and transportation mangement plan that aims to reduce vehicle miles travelled in the Tahoe Basin.

Table 1 | TMDL PM Summary

TMDL PM	SOURCE CATEGORY	DESCRIPTION
Miles of Roads Treated	Forested Uplands	Tracks the miles of permanent forest roads, paved or unpaved, that are decommissioned or on which stormwater retrofits are implemented
Miles of Roads Inspected and Maintained	Forested Uplands	Tracks the miles of permanent forest roads, paved or unpaved, that are inspected and/or maintained to reduce stormwater pollution
Miles of Roads Created	Forested Uplands	Tracks the miles of permanent forest roads, paved or unpaved, that are created or added to a road owner's permanent road network
Acres of Disturbed Area Restored or Enhanced	Forested Uplands	Tracks the total acres of disturbed area, not including roads or Stream Environment Zones (SEZ), in the Forested Uplands that is restored, enhanced or created
Facilities With Stormwater Retrofits	Forested Uplands	Tracks the number of public facilities in the Forested Uplands that are retrofitted with BMPs to reduce runoff volumes and remove fine sediment particles and nutrients contained therein
Linear Feet of Stream Channel Restored or Enhanced	Stream Channel	Tracks linear feet of stream channel restoration and enhancement

Key Definitions – Non-Urban Source Categories

- **Permanent Road:** Paved or unpaved forest roads constructed for long-term use. For USFS LTBMU, this means roads that are part of the National Forest Road System. Permanent roads do not include roads created for the purposes of serving a construction site. Therefore, permanent roads generally do not include roads, skid trails and landings constructed for vegetation management activities.

- **Temporary Road:** Unpaved forest roads created (or reopened) for temporary construction or vegetation management access and planned to be decommissioned at the termination of the project. This does not include temporary landings or skid trails constructed for vegetation management activities.

- **Decommissioned Road:** Roads are decommissioned when they are removed from the managed road system (from the permanent road network) and blocked from use. Roads that are blocked from use are left to degrade or obliterated –e.g. through recontouring of the road to match the former grade.

- **Retrofitted Road:** Roads are retrofitted if BMPs have been installed to minimize runoff volume, minimize runoff reaching surface water, and maximize infiltration.

- **Disturbed Area:** Disturbed areas are large areas in the forested uplands in which soil, hydrologic function and/or vegetation has been degraded by development or operations undertaken by the property owner or other users. This does not include SEZs or roads. Examples of Disturbed Areas include areas defined as soft coverage by TRPA as well as ski runs, staging areas and landings.

- **Public Facilities:** Public facilities are administrative and/or recreational facilities such as parking lots, trailheads and buildings that are on land owned by public agencies. Public facilities generally have impervious surfaces such as rooftops and asphalt that can generate and concentrate storm water pollutants.

- **Stream Restoration:** Stream channels are considered functionally restored when the natural hydrologic, geomorphic, and biologic processes, characteristics and functions have been reestablished in a previously degraded system. In terms of water quality benefits, restoration typically involves reconnection of a stream to its floodplain to improve attenuation of flood waters and maintenance of stream flows through its release, thereby reducing channel erosion and improved ability to filter contaminants. Restoration actions may include any combination of bank protection, bed (grade) stabilization, bank strengthening, channel fill and toe stabilization, bank lowering and angle reduction, and channel reconstruction/realignment.

- **Stream Enhancement:** Enhancements improve water quality, but do not necessarily reestablish hydrologic or geomorphic processes, characteristics and functions. Laying the banks back, installing stream barbs, grade control and/or bed and bank stabilization are all examples of enhancements.

2014 TMDL PM Implementation Summary

The table below lists activity implementation for each performance measure during 2004 to 2013, as well as the accomplishments of each entity implementing water quality improvement projects in the non-urban source categories.

Table 2 | 2014 TMDL PM Implementation Summary Table

	MILES OF ROADS TREATED	MILES OF ROADS INSPECTED & MAINTAINED	MILES OF ROADS CREATED	ACRES OF DISTURBED AREA RESTORED OR ENHANCED	FACILITIES WITH STORMWATER RETROFITS	LINEAR FEET OF STREAM CHANNEL RESTORED OR ENHANCED
USFS LTBMU	256.11	947	0	5.11	7	20,000
CTC	1.59	0	0	84.88	0	1,200
NTRT	1.36	347.34	0	39.30	2	1,900
CA State Parks	1.74	23.45	0.1	0.90	3	0
Heavenly	0.58	151.24	0	38.33	1	0
Homewood	13.15	128	0	0.89	0	0
Diamond Peak	0	28.6	0	0	0	0
Other	0	0	0	0	0	3,681
Basinwide Total	**274.53 miles**	**1,625.63 miles**	**0.1 miles**	**169.41 acres**	**13 facilities**	**26,781 linear feet**

FOREST ROADS

Figure 1 | **Cumulative Miles of Roads Treated 2004-2013**

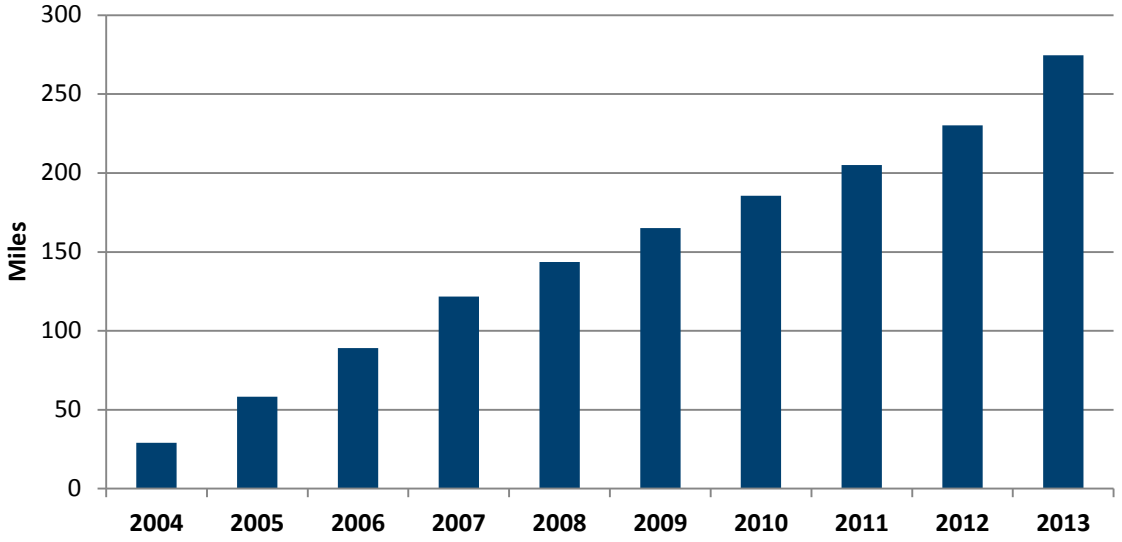
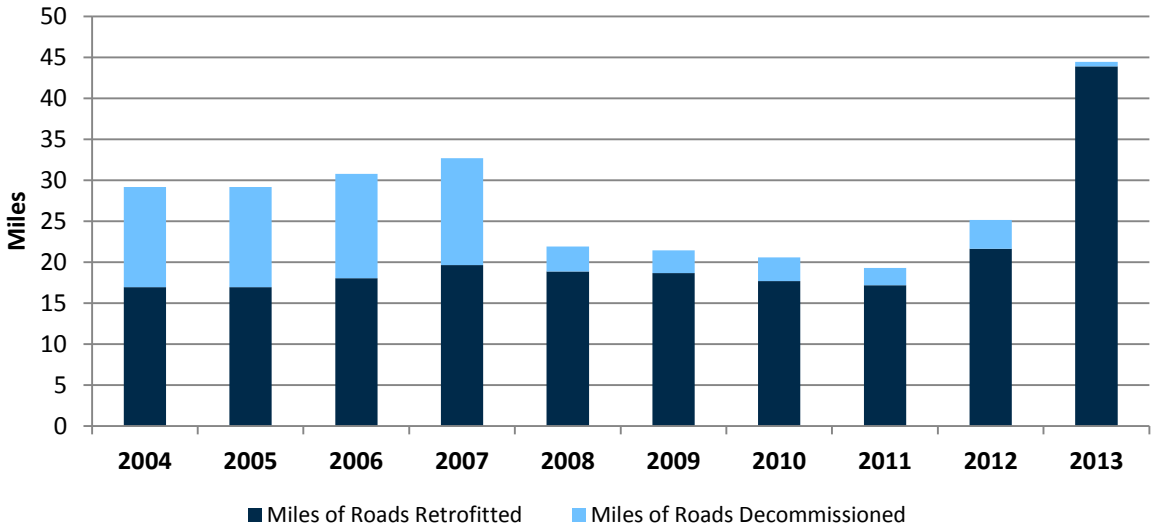


Figure 2 | **Annual Total Miles of Roads Treated 2004-2013**



Miles of Roads Treated

Land managers treated **274 miles** of forest roads over the ten year reporting period, an average of **27 miles** of roads treated per year. Cumulatively, this included decommissioning 65 miles and retrofitting 209 miles of road. Considerably more road miles were decommissioned between 2004 and 2007 as land managers actively tried to reduce the size of their road networks. Over time the total miles of roads decommissioned each year should diminish as the permanent road network stabilizes. Throughout the reporting period land managers retrofitted active roads to reduce stormwater runoff, improve accessibility and meet safety standards. An increase in the miles of roads retrofitted in 2013 is attributed to 41 miles of road retrofit completed by USFS LTBMU for their North Shore Transportation Access and Travel Management Plan.

Table 3 | **Miles of Roads Treated 2004-2013 by implementing entity**

IMPLEMENTER	TOTAL MILES	% OF TOTAL
USFS LTBMU	256.11	93%
CTC	1.59	1%
NTRT	1.36	<1%
CA State Parks	1.74	1%
Heavenly	0.58	<1%
Homewood	13.15	5%

Miles of Roads Inspected and Maintained

Land managers inspected and maintained a total of **1,474 miles** of forest roads over the ten year reporting period, inspecting and maintaining an average of **147 miles** of roads per year. The vast majority of forest roads in the Tahoe Basin are managed by USFS LTBMU. USFS LTBMU is also the only land manager that currently implements a regular road inspection and maintenance program. Per the goals of this program, the U.S. Forest Service aims to inspect and maintain 20 percent of its road network annually, with and 100 percent achieved every five years. With a total permanent road network of approximately 250 miles, this equates to approximately 50 miles of roadway inspection and maintenance each year.

The total miles of permanent road in the Forested Uplands are unknown because not all land managers have completed a full road inventory. Efforts are underway by land managers to inventory the entire road network, which will help clarify data for those TMDL PMs relevant to roads. For this reporting period, land management entities lacking a precise count of their total roadway miles reported significant roadway improvement projects and/or estimates of the average mileage of road maintenance performed each year. Land managers that had a full inventory of their roads, but lacked a formal process for tracking road inspection and maintenance, estimated that 100 percent of their roads were inspected every year because maintenance crews performed visual inspections as they drove the entire road network annually.

Miles of Roads Created

The only road created during the reporting period was a 0.1 mile stretch of unpaved road in Sugar Pine Point State Park in 2008 by California State Parks. This road was constructed to re-route an existing fire road. Temporary roads developed as part of forest fuel reduction projects are not considered to have been created unless and until they are added to a land management agency's inventory of permanent roads.

Figure 3 | **Annual Total Miles of Roads Inspected & Maintained 2004-2013**

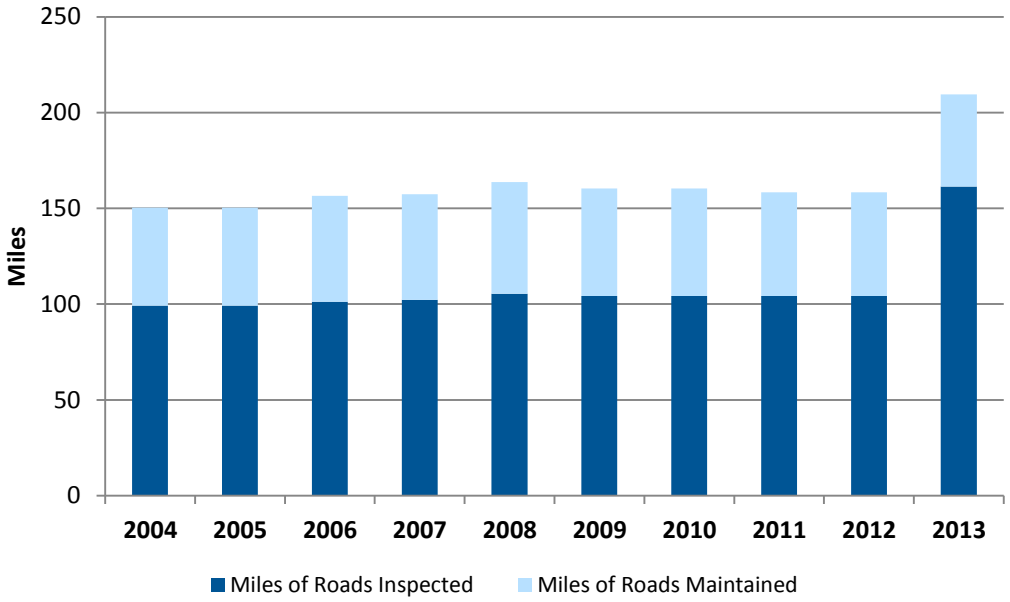


Table 4 | **Miles of Roads Inspected & Maintained 2004-2013 by implementing entity**

IMPLEMENTER	TOTAL MILES	% OF TOTAL
USFS LTBMU	947	59%
NTRT	347.34	21%
CA State Parks	23.45	1%
Heavenly	151.24	9%
Homewood	128	8%
Diamond Peak	28.6	2%

Featured Project
Van Sickle Bi-State Park

In 2011, the Nevada Division of State Lands, in partnership with the California Tahoe Conservancy, completed a road retrofit and facility improvement project in Van Sickle Bi-State Park. Van Sickle Bi-State Park is located next to the Stateline casino core. In a great display of cross-state coordination, an entry road and multiple parking and trailhead facilities were completely retrofitted to reduce stormwater runoff. Future phases of this project are planned to enhance public access and incorporate additional water quality improvements and SEZ restoration work. As the lead implementing entity, NTRT reported 1 facility retrofitted and 0.67 miles of roads retrofitted for this project.

PROJECT AT A GLANCE

Land Management: NTRT, CTC

Location: Van Sickle Bi-State Park, Stateline, NV

Size: 698 acres

Status: Complete

Implementation Timeline: 2009 - 2011

TMDL PM Reported: Miles of Roads Treated, Facilities with Stormwater Retrofits

Extent: 0.67 miles, 1 facility

Action Type: Retrofit

DISTURBED AREAS

Figure 4 | **Cumulative Acres of Disturbed Areas Restored or Enhanced 2004-2013**

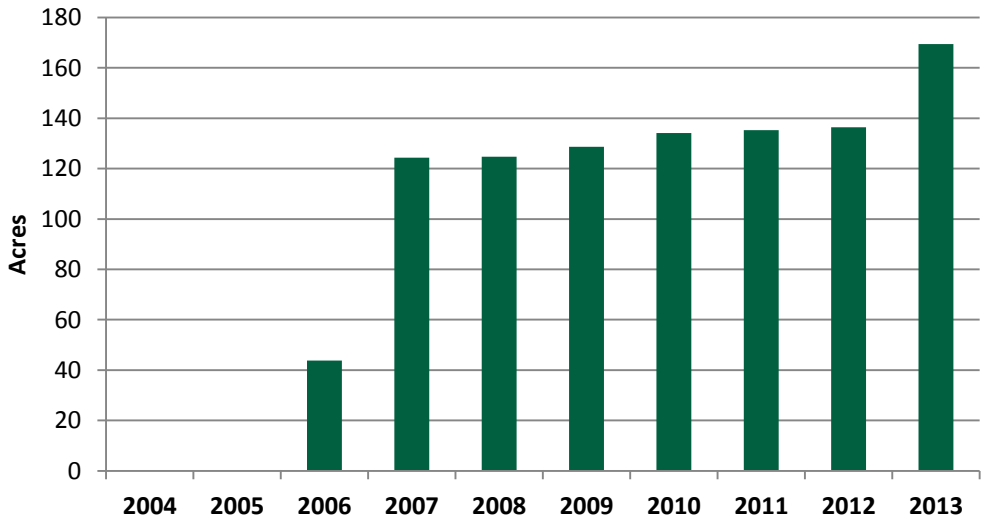
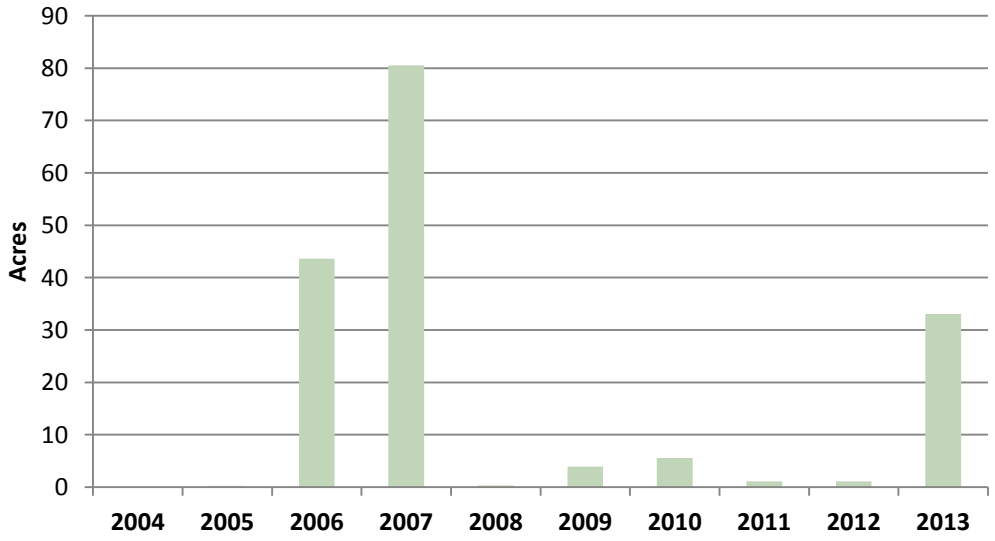


Figure 5 | **Annual Total Acres of Disturbed Areas Restored or Enhanced 2004-2013**



Acres of Disturbed Area Restored or Enhanced

Forest land managers restored or enhanced a total of **169 acres** of disturbed area over the ten year reporting period. As shown in Figure 5, the total acres restored or enhanced varied significantly by year. Restoration and enhancement of disturbed acres will likely continue to vary over time as it is an activity tied to the amount of acreage disturbed by land management activities – such as grading of a ski slope, or to natural events – such as a wildfire. CTC, NTRT and Heavenly implemented the majority of restoration and enhancement activities on disturbed areas, accounting for roughly 96 percent of all the work performed in the Tahoe Basin. These implementation numbers can be attributed to urban lot programs administered by CTC and NTRT, and ski run enhancements performed by Heavenly.

There was a noticeable increase in the acres of disturbed area restored or enhanced in 2007, due largely to restoration actions undertaken by CTC and USFS LTBMU in response to the Angora Fire that burned 3,100 acres of land in late June, 2007. Both these entities allocated emergency resources immediately following the fire to respond to flooding and erosion concerns.

Table 5 | **Acres of Disturbed Areas Restored or Enhanced 2004-2013 by implementing entity**

IMPLEMENTER	TOTAL ACRES	% OF TOTAL
USFS LTBMU	5.1	3%
CTC	84.9	50%
NTRT	39.3	23%
CA State Parks	0.9	1%
Heavenly	38.3	22%
Homewood	0.9	1%

Featured Project
Angora Fire Restoration Project

Immediately following the Angora Fire in 2007, the California Tahoe Conservancy (CTC) conducted restoration activities on 80 acres to remove dead trees and to manage soil erosion and sedimentation to Lake Tahoe. In partnership with USFS LTBMU, CTC was able to seed and mulch 70 acres, install 1,500 feet of silt fence and install 2,500 feet of coir erosion logs. For these efforts, CTC reported 80 acres of disturbed area restored, by far the largest disturbed area restoration or enhancement project reported during the ten year reporting period. The accomplishments reported in 2007 were part of a larger CTC and USFS LTBMU led Angora Fire restoration effort that concluded in 2012.

PROJECT AT A GLANCE

Land Ownership: CTC, USFS LTBMU

Location: Angora Creek Watershed, El Dorado County, CA

Size: 80 acres

Status: Complete

Implementation Timeline: Summer 2007 – Fall 2012

TMDL PM Reported: Acres of Disturbed Area Restored or Enhanced

Extent: 80 acres

Activity Type: Restoration

FACILITIES

Facilities with Stormwater Retrofits

Thirteen (13) public facilities in the Forested Uplands received stormwater retrofits since 2004. There was no consistent implementation trend to stormwater retrofit implementation during the reporting period with most entities reporting a single facility retrofitted every 2-4 years. The majority of facilities (5) were retrofitted in 2013 with California State Parks completing elements of the Emerald Bay Eagle Point Campground Erosion Control and Rehabilitation project and USFS LTBMU completing work on campgrounds and day use areas at Nevada Beach, and at Meeks Bay Resort. Other retrofits during the reporting period were completed on picnic areas, visitor centers, trailheads and parking lots. Over time the total number of facilities retrofitted each year should diminish as existing facilities have fully implemented retrofits and new facility construction slows.

Table 6 | **Facilities with Stormwater Retrofits 2004-2013 by implementing entity**

IMPLEMENTER	TOTAL FACILITIES	% OF TOTAL
USFS LTBMU	7	54%
NTRT	2	15%
CA State Parks	3	23%
Heavenly	1	8%

Figure 7 | **Cumulative Facilities with Stormwater Retrofits 2004-2013**

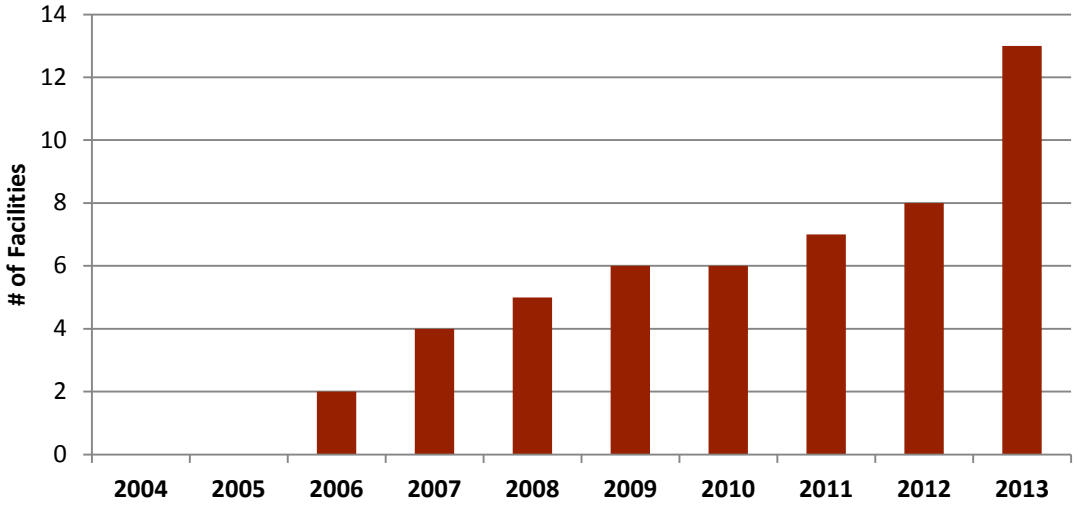
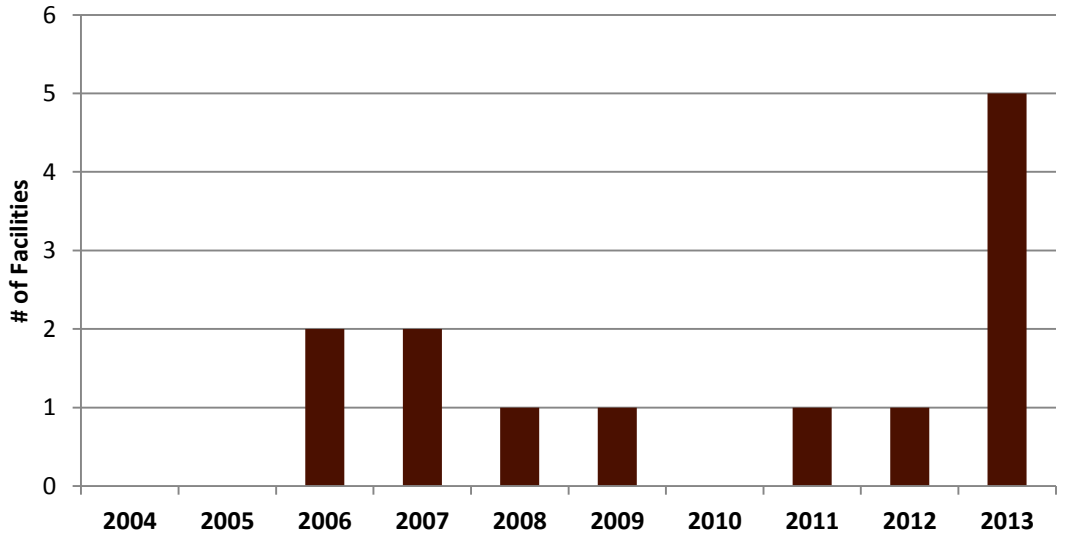


Figure 8 | **Annual Total Facilities with Stormwater Retrofits 2004-2013**



Featured Project

Emerald Bay Eagle Point Campground Erosion Control & Rehabilitation Project

In 2013, California State Parks completed Phase I of the Emerald Bay Eagle Point Campground Erosion Control and Rehabilitation project. This project rehabilitated 34 existing campsites on steep slopes to improve drainage and reduce sediment flow. In addition, California State Parks installed erosion control BMPs such as rock lined ditches on campground roads and facilities. Phase II of the project is expected to be completed in the summer of 2015 and will include additional campsite, road and facility improvements aimed at reducing erosion and improving drainage.

PROJECT AT A GLANCE

Land Ownership: CA State Parks

Location: Emerald Bay State Park, El Dorado County, CA

Status: Complete

Implementation Timeline: 2010 - 2013

TMDL PM Reported: Facilities with Stormwater Retrofits

Extent: 1 facility (34 campsites)

STREAM CHANNELS

Figure 9 | **Cumulative Linear Feet of Stream Channel Restoration or Enhancement, 2004-2013**

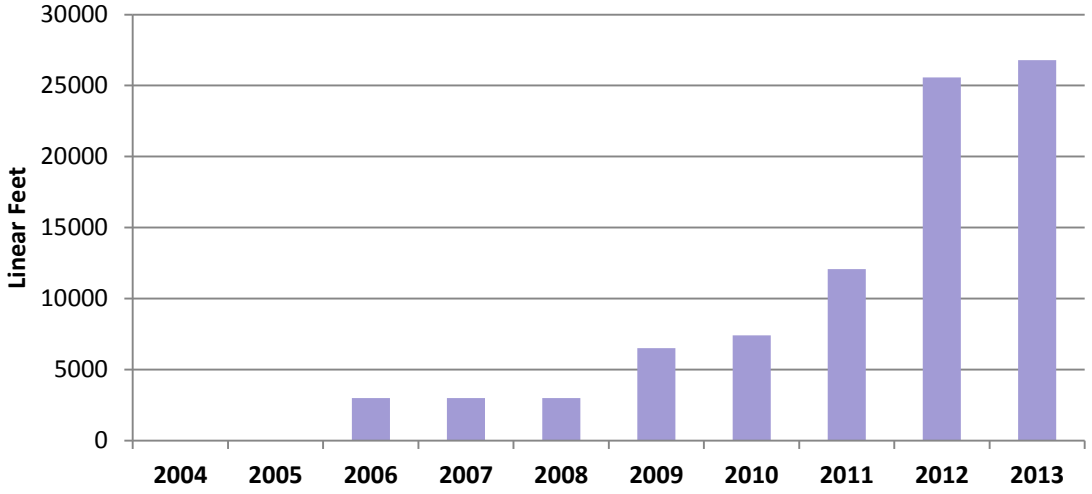
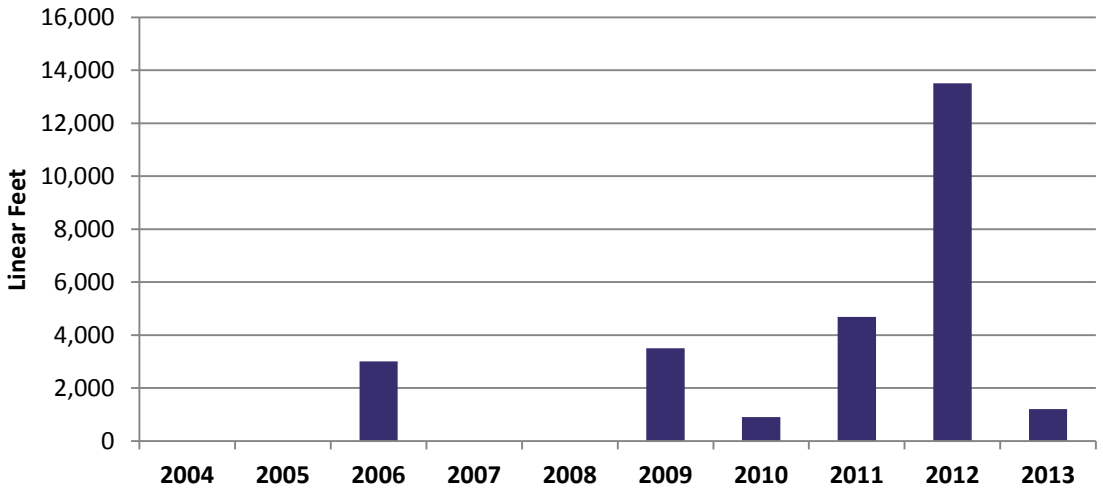


Figure 10 | **Annual Linear Feet of Stream Channel Restoration or Enhancement, 2004-2013**



Linear Feet of Stream Channel Restored or Enhanced

Between 2004 and 2013, land managers implemented **11 stream channel restoration and enhancement projects**. These projects cumulatively restored or enhanced approximately **34,600 linear feet**, or 6.5 miles of stream channel. Of this total, approximately 21,300 linear feet were located on the Upper Truckee River, Blackwood Creek and Ward Creek, which together contribute 96 percent of the total FSP loading from the stream channel source category. A considerable increase in restoration and enhancement activity in 2012 can be attributed to USFS LTBMU Cold Creek-High Meadows Ecosystem Restoration project that resulted in restoration of some 10,500 linear feet of stream channel along Cold Creek.

The Upper Truckee River Middle Reach Restoration Project (Reaches 3 and 4), implemented by the City of South Lake Tahoe in 2011, is included in the data for this PM. Although Non-Urban Source Category TMDL PMs rarely include projects implemented by urban jurisdictions, this project is the among the largest restoration project on the Upper Truckee River to date and significantly contributed to reducing FSP loading from the stream channel erosion source category.

Table 7 | **Linear Feet of Stream Channel Restoration or Enhancement 2004-2013 by implementing entity**

IMPLEMENTER	TOTAL LINEAR FEET	% OF TOTAL
USFS LTBMU	20,000	75%
CTC	1,200	4%
NTRT	1,900	7%
CSLT	3,681	14%

Featured Project

Cold-Creek-High Meadows Ecosystem Restoration

USFS LTBMU acquired 1,790 acres of land in January 2003 in the highly degraded Upper Cold Creek Watershed. This land had been degraded through a long history of logging and cattle grazing which significantly altered the natural hydrology of upper Cold Creek and impacted the surrounding High Meadows ecosystem. USFS LTBMU performed restoration work from 2010 to 2012 to restore stream function and floodplain configuration. In addition, work was done to decrease pollutant loading by reducing bank erosion and increasing frequency, duration, and extent of overbank flows onto the floodplain. Ultimately this project restored 10,500 linear feet of stream channel, decreasing pollutant loading and providing habitat benefits to the High Meadows ecosystem.

PROJECT AT A GLANCE

Land Ownership: USFS LTBMU

Location: Cold Creek Watershed at High Meadow, El Dorado County, CA

Size: 1,790 acres

Status: Complete

Implementation Timeline: 2013 – 2015

TMDL PM Reported: Linear Feet of Stream Channel Restored or Enhanced

Extent: 10,500 linear feet

Action Type: Restoration

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