

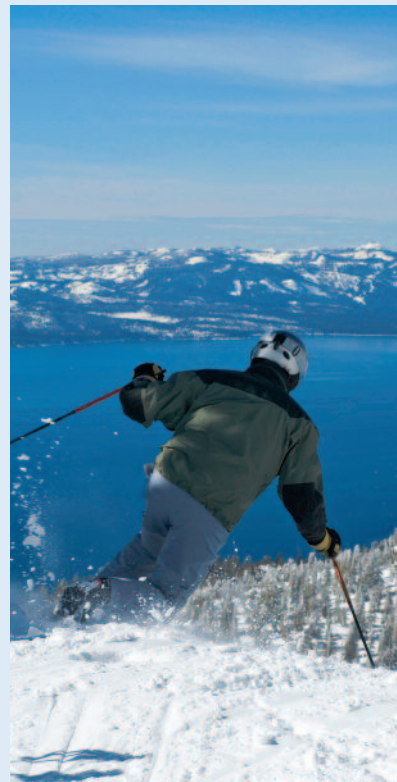


*continuing the commitment*

# RESTORATION IN PROGRESS

ENVIRONMENTAL IMPROVEMENT PROGRAM UPDATE ||  
PLANNING HORIZON THROUGH 2018

*lake tahoe*



# Lake Tahoe

## RESTORATION IN PROGRESS

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ENVIRONMENTAL IMPROVEMENT PROGRAM

It's our moral obligation to be faithful stewards of our heritage and protect this area for future generations. So that's why we're here today.

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# Program Overview



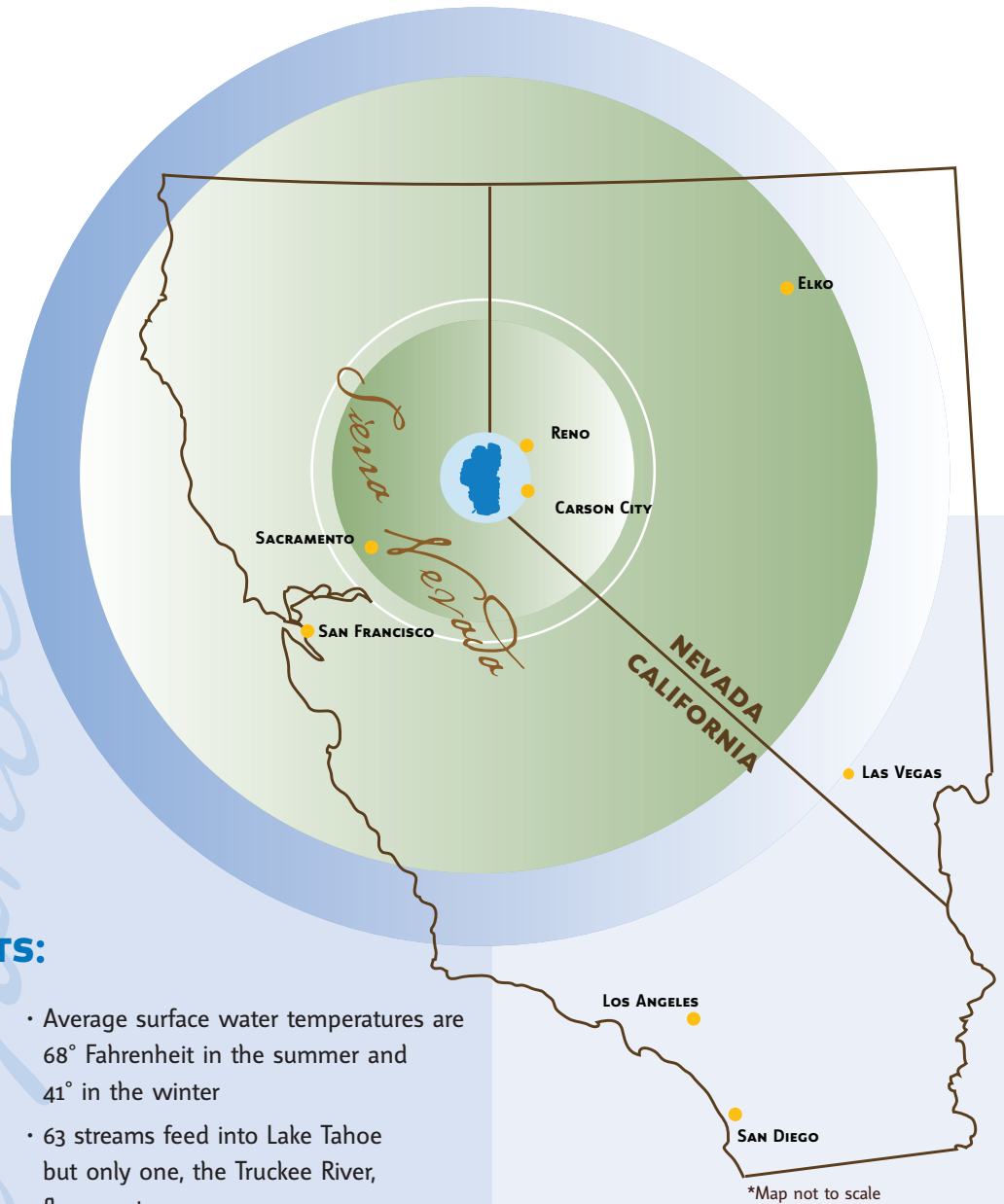
## LAKE TAHOE: A NATIONAL TREASURE

LAKE TAHOE IS ONE OF THE LARGEST, DEEPEST, AND CLEAREST LAKES in the world. Its cobalt blue appearance, spectacular alpine setting, and remarkable water clarity is recognized worldwide. The Lake's earliest inhabitants, the Washoe Tribe, demonstrated a deep respect for the fragile environment that was their home and still revere this magnificent place. Recreational opportunities and scenic vistas have made Lake Tahoe a top national and international tourist destination.



Like many national treasures, the Lake Tahoe Basin is threatened by the impacts of the land use and transportation patterns developed in the last generation. The Lake's water clarity declined by nearly a foot every year from the late 1960s to the end of the century, and has only recently begun to stabilize. Fine sediment particles and algae-nourishing phosphorus and nitrogen continue to flow into the Lake from urban and highway runoff, air pollution, and other sources. The Basin's current transportation infrastructure inadequately accommodates traffic in peak travel seasons, bike and pedestrian users, and public access to the Lake.

Lake Tahoe is situated within the Sierra Nevada Mountain Range straddling the California-Nevada border. The main crest of the Sierra Nevada Range is found to the west and the Carson Range to the east. Two thirds of Lake Tahoe is in California and the remainder is in Nevada.



\*Map not to scale

## LAKE TAHOE FAST FACTS:

- Lake Tahoe is 2 million years old
- Holds 39 trillion gallons of water
- Size of watershed: 501 sq. miles
- Lake surface area: 192 sq. miles
- 12 miles wide
- 22 miles long
- 72 miles of shoreline
- 1,645 ft. deep
- 6,223 ft. elevation (natural rim)
- 2 states: CA, NV
- 5 counties, 1 city
- 66,000 Tahoe Basin year-round residents
- Majority of private property owners are part-time residents
- US Forest Service and state agencies manage almost 85% of land area
- Average surface water temperatures are 68° Fahrenheit in the summer and 41° in the winter
- 63 streams feed into Lake Tahoe but only one, the Truckee River, flows out
- Approximately 3 million people visit Lake Tahoe every year
- The Lake is designated as an Outstanding National Resource Water under the Federal Clean Water Act
- Lake Tahoe is the second deepest lake in the United States
- Lake Tahoe is so deep that a single drop of water entering the Lake today will take about 650 years to find its way out



We have a shared responsibility to build on our commitment at all levels to be sure the Lake and its environs are protected.

President Bill Clinton, Lake Tahoe Presidential Forum, July 26, 1997

President Bill Clinton and Vice President Al Gore at the 1997 Lake Tahoe Presidential Forum.

The Tahoe Basin is facing several new and emerging challenges. The Angora Wildfire of 2007 raised awareness that the Basin's overstocked forests have dramatically increased the risk of catastrophic wildfire. The recent appearance of several aquatic invasive species also threatens the ecological health of the Lake, the quality of its beaches, and the drinking water supplies of many local communities.

Looking to the future, the impacts of climate change pose a major threat to both the environment and economy of the Tahoe Basin. The average surface temperature of Lake Tahoe in July has risen by more than 3 degrees Fahrenheit since 1999, and more precipitation is falling as rain rather than snow. If these trends continue, sediment-laden runoff may increase, and the Lake may no longer mix enough to retain its clarity. These changes could also devastate the tourist-dependent economy.

Significant continued investments will be needed from federal, state, local, and private sources to effectively address these challenges, and to maintain a collaborative effort in protecting the environment and the economy of the Lake Tahoe Basin.

## A SHARED RESPONSIBILITY

Restoring and protecting Lake Tahoe has been a shared responsibility since 1969 when the states of California and Nevada established the Tahoe Regional Planning Agency (TRPA), the nation's first bi-state environmental planning and regulatory agency. The United States Congress ratified the Bi-State Compact which created TRPA and the federal government is a key partner in this shared responsibility. TRPA has a unique role in working cooperatively with its federal, state, local, and private partners to protect the ecological health of the Basin while providing for orderly growth and development consistent with environmental standards. The Agency's 15-member board includes members from the two states, locally elected officials, and a non-voting Presidential appointee.

The Compact, as revised in 1980, gave TRPA authority to adopt environmental quality standards, called thresholds, and to define the capacity of the Region to accommodate additional development. The TRPA Governing Board adopted the threshold standards in 1982, and in 1987 they enacted a Regional Plan setting forth strategies to achieve the



At left: President Bill Clinton and Vice President Al Gore aboard a research vessel on Lake Tahoe.

thresholds. The Compact also requires the Regional Plan to contain provisions to help reduce dependency on the private automobile in order to better protect air and water quality.

## HISTORY OF THE ENVIRONMENTAL IMPROVEMENT PROGRAM

TRPA launched the Environmental Improvement Program (EIP) in an effort to better implement the Regional Plan and highlighted it at the Presidential Forum at Lake Tahoe in 1997. Recognizing that capital investments, research, and monitoring were essential components of the Regional Plan, the EIP called for an investment of \$908 million in capital projects and \$58 million in research and monitoring. The EIP also identified hundreds of specific projects and programs to be undertaken by more than 50 funding partners, including federal, state, and local agencies and the private sector. The projects were focused on improving air, water, and scenic quality, forest health, fish and wildlife, and public access to the Lake and other recreation areas. The prime directive of the EIP was to move the Tahoe Basin closer to environmental threshold attainment.

## THE FEDERAL PARTNERSHIP

The federal government has a long history of conservation in the Lake Tahoe Basin. Preservation efforts include congressional approval of the Compact, the consolidation of three national forests into the Lake Tahoe Basin Management Unit (LTBMU) of the US Forest Service to protect the watershed, and the passage of numerous funding bills.

At the 1997 Lake Tahoe Forum, President Clinton and Vice President Gore renewed the federal commitment to Lake Tahoe by issuing an Executive Order creating the Lake Tahoe Federal Interagency Partnership. Through this collaborative effort, the federal agencies agreed to increase federal funding to strive toward attainment of environmental thresholds, and to coordinate all federal activities in the Basin. Oversight of the partnership is provided by the Tahoe Regional Executives, which consists of the regional administrators of partner agencies. Day-to-day coordination and program-level implementation rests with the Lake Tahoe Basin Executive Committee (LTBEC), which consists of the local federal officials in the Tahoe Basin.

The Lake Tahoe Restoration Act (LTRA) of 2000 authorized the federal share of the EIP funding, which allowed the Forest Service to invest \$300 million in EIP projects and programs. In 2003, Congress amended the Southern Nevada Public Land Management Act (SNPLMA) to allow the proceeds from sales of surplus federal lands in southern Nevada to fund the federal share of the EIP. Through the LTRA, SNPLMA, and other sources, the federal agencies invested more than \$293 million in the EIP from 1997 to 2006.

The Lake Tahoe Basin Management Unit of the Forest Service administers 75 percent of the land in the Lake Tahoe Basin, and is responsible for a broad range of EIP projects and programs. Other federal agencies providing significant contributions include the Army Corps of Engineers, the Bureau of Reclamation, the Fish and Wildlife Service, the Natural Resources Conservation Service, the Federal

Highway Administration, United States Geological Survey, and the Environmental Protection Agency.

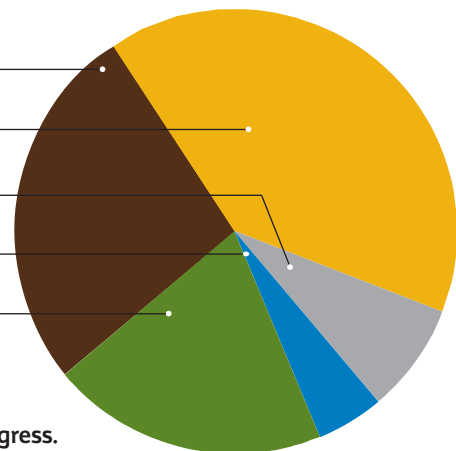
## STATE COMMITMENTS

The states of California and Nevada have also played a key role in developing and implementing the EIP. In 1997, Governor Wilson of California and Governor Miller of Nevada convened a gubernatorial summit in anticipation of the Presidential Forum, and signed a Memorandum of Agreement pledging their support for the EIP.

Voters in Nevada then approved a bond measure to provide \$82 million, Nevada's share of EIP funding for the first decade. The Divisions of State Lands, Environmental Protection, and Transportation are largely responsible for oversight and funding of EIP projects in Nevada.

### LOOKING BACK: EIP CAPITAL INVESTMENT IN PROJECTS BY FUNDING SECTOR: 1997-2006

● <b>Federal:</b>	\$293 million (27%)
● <b>State of CA:</b>	\$446 million (40%)
● <b>State of NV:</b>	\$82 million (8%)
● <b>Local:</b>	\$53.4 million (5%)
● <b>Private:</b>	\$216 million (20%)
<b>TOTAL:</b>	<b>\$1.1 billion</b>



Funds reflected in this graph represent projects completed or in progress.



In 1982, TRPA adopted nine environmental threshold carrying capacities (thresholds), which set environmental standards for the Lake Tahoe Basin and indirectly define the capacity of the Region to accommodate additional land development. The nine thresholds are water quality, soil conservation, air quality, vegetation, wildlife, fisheries, scenic resources, noise, and recreation. Many of the environmental thresholds will take generations to achieve and a sustained commitment to conservation is imperative. The EIP is intended to accelerate threshold attainment.

## ENVIRONMENTAL THRESHOLD GOALS FOR THE LAKE TAHOE BASIN

**Water Quality:** Return the Lake to 1960s water clarity and algal levels by reducing nutrient and sediment in surface runoff and groundwater.

**Soil Conservation:** Preserve natural stream environment zones (SEZ), restore 25% of disturbed urban SEZ areas (1,100 acres), and reduce total land coverage.

**Air Quality:** Achieve strictest of federal, state, or regional standards for carbon monoxide, ozone, and particulates; increase visibility; reduce U.S. 50 traffic; and reduce vehicle miles of travel.

**Vegetation:** Increase plant diversity in forests, preserve uncommon plant communities including deepwater plants, enhance late seral forests and reduce forest fuels, and maintain minimum sustainable populations of sensitive plants including Tahoe Yellow Cress.

**Wildlife:** Provide habitat for special interest species, prevent degradation of habitats of special significance.

**Fisheries:** Maintain 180 miles of good to excellent stream habitat, achieve nearly 6,000 acres of excellent lake habitat, and attempt to reintroduce Lahontan Cutthroat Trout.

**Scenic Resources:** Maintain or improve 1982 roadway and shoreline scenic travel route ratings, maintain or improve views of individual scenic resources, and maintain or improve quality of views from public outdoor recreation areas.

**Noise:** Minimize noise disturbance from single events, and minimize background noise disturbance in accordance with land use patterns.

**Recreation:** Preserve and enhance a high quality recreational experience. Preserve undeveloped shorezone and other natural areas, and maintain a fair share of recreational capacity for the general public.



The state of California also fulfilled its funding commitment in the first decade of the EIP. Through projects funded primarily by the California Tahoe Conservancy, State Parks, and Caltrans, the state of California committed more than \$446 million to EIP projects from funds made available from Propositions 204, 12, 40, 50, 84, and other sources.

## LOCAL AND PRIVATE CONTRIBUTIONS

Local and private contributions have been one of the hallmarks of the EIP. Because stormwater runoff from local roads and private residential and commercial development conveys sediment and other pollutants that degrade Lake clarity, erosion control measures known as best management practices (BMPs) are an important component of the Regional Plan and the EIP. Through investments in BMPs and other projects, local and private sources have contributed nearly \$270 million in the first decade of the EIP.

The major EIP partners in local government include the counties of Washoe, Douglas, El Dorado, and Placer, the city of South Lake Tahoe, and local utility and fire protection districts. Private partners include a broad spectrum of interests, including the Heavenly Mountain Resort and Homewood ski area, the Chambers of Commerce on the north and south shores, the North Lake Tahoe Resort Association, the League to Save Lake Tahoe, and the Lake Tahoe Transportation and Water Quality Coalition.

## LOOKING BACK – A DECADE OF ACCOMPLISHMENTS

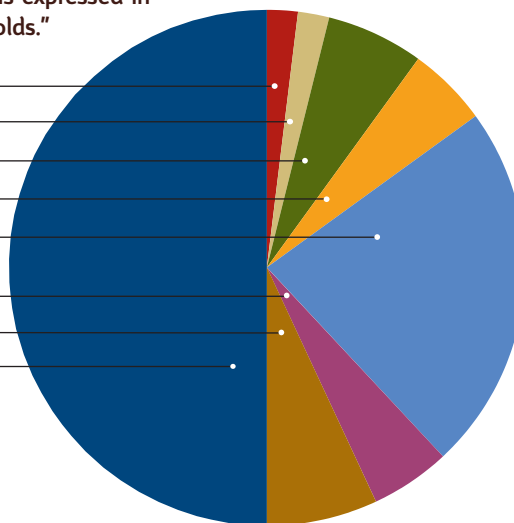
In total, all partners contributed more than \$1.1 billion for EIP projects and programs in the first phase. Approximately 270 EIP capital projects are on the ground, and hundreds more are in the planning and implementation stages. These projects have improved the health of

### EIP INVESTMENT BY ENVIRONMENTAL THRESHOLD: 1997-2006

#### Categories of Investment

The environmental and ecological value of the Basin is expressed in terms of categories called the "Environmental Thresholds."

● Wildlife	2%	_____
● Fisheries	2%	_____
● Vegetation	6%	_____
● Recreation	5%	_____
● Air Quality/Transportation	23%	_____
● Scenic Resources	5%	_____
● Soil Conservation	7%	_____
● Water Quality	50%	_____



In recent years, funding for forest health and vegetation projects has increased dramatically and will continue to help reduce the threat of catastrophic wildfire.



**Left: US Senator Dianne Feinstein of California addresses the public at the 12th Annual Lake Tahoe Summit. Seated at right include Governor Jim Gibbons of NV, Undersecretary of Agriculture Mark E. Rey, and Secretary of Interior Dirk Kempthorne. Right: Sunset at Lake Tahoe.**

Tahoe forests and watersheds, reduced traffic congestion and air pollution on the Basin’s roadways, and increased public access to the Lake and other recreation areas.

The latest water quality data suggest that these investments are also making a difference in reversing the downward slide in Lake Tahoe’s fabled water clarity. After decades of steady decline, the Lake’s clarity has stabilized in recent years, and new modeling results predict that the Basin’s clarity goals can be achieved with sustained funding and project implementation from the EIP partners.

## **LOOKING AHEAD – A RENEWED COMMITMENT**

The next 10-year phase of the EIP will build upon our accomplishments to date, with an increased emphasis on monitoring and focused research, adaptive management, and performance benchmarks. These new areas of emphasis are essential to ensure that the most cost-effective projects are implemented, and to better document and evaluate progress toward meeting the environmental thresholds.

Another priority will be to launch a new strategy to advance Lake Tahoe’s clarity goals.

In 2002, the states of California and Nevada cooperatively began to develop a water quality restoration plan for Lake Tahoe, known as the Total Maximum Daily Load, or TMDL, as required by the Clear Water Act. As part of those efforts, the states have issued a “Clarity Challenge” which calls for an improvement in clarity from 70 feet to 80 feet in 15 to 20 years. The agencies are now in an extensive collaborative process to complete the TMDL, and TRPA will be incorporating the TMDL findings and strategies into the update of the Regional Plan.

Addressing the potential impacts of climate change will also be a new element of the EIP. The EIP partner agencies are launching a comprehensive climate change strategy to reduce the Basin’s carbon footprint, to adapt to already well-documented changes in local forests and watersheds, and to help redevelop the Basin’s dated urban areas into vibrant, sustainable communities.

Other EIP priorities include:

- Achieving the fuels reduction targets in the 10-year Multi-Jurisdictional Fuels Reduction and Wildfire Prevention Strategy;
- Restoring and protecting the Basin’s watersheds and stream environment zones;

- Adopting and implementing a comprehensive aquatic invasive species management plan;
- Expanding the Basin’s transit facilities and bike and pedestrian trail network;
- Achieving the milestones in the Lahontan Cutthroat Trout and Tahoe Yellow Cress Recovery Plans; and
- Improving Lake access and recreational facilities.

An additional \$2.45 billion in public and private investments will be needed over the next decade to effectively implement these and other EIP programs and to maintain progress toward meeting the Basin’s environmental threshold standards. While approximately \$700 million has already been committed to this phase by the EIP partners, an additional \$1.8 billion remains to be secured. TRPA and its federal, state, local, and private partners will be working together to raise these funds, to establish priority projects,

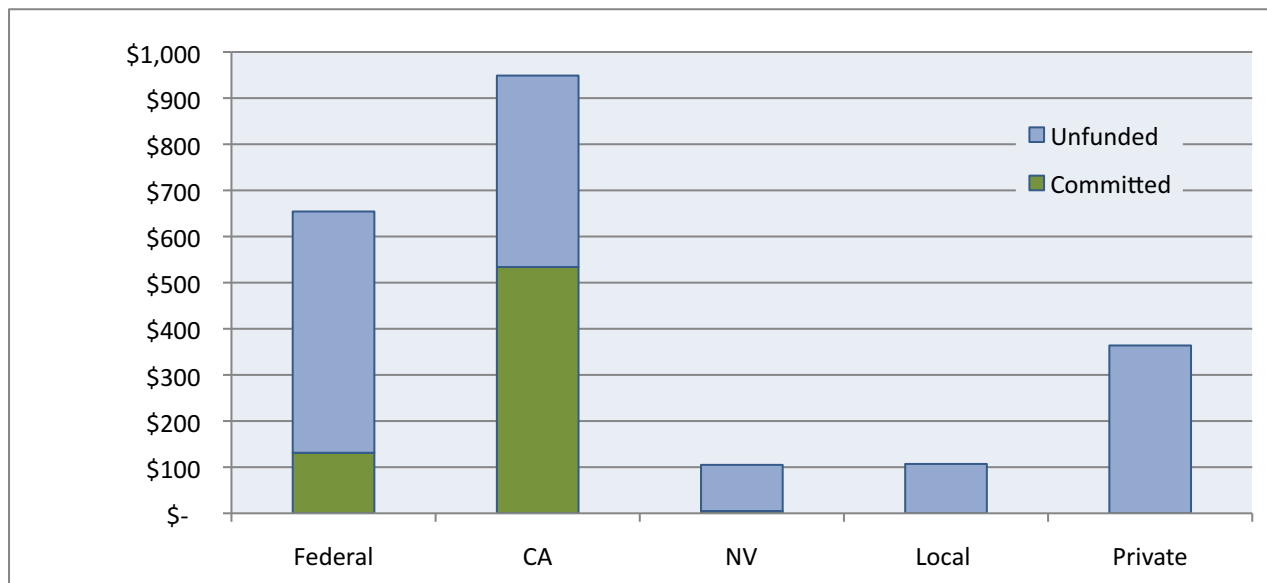
and to document our efforts in annual progress reports over the next decade of EIP implementation.

The next phase of the EIP will focus on six areas:

- Watersheds, Habitat, & Water Quality
- Forest Management
- Air Quality & Transportation
- Recreation & Scenic Resources
- Applied Science
- Program Support

EIP partners developed these six areas of emphasis through a collaborative process and to contribute to threshold attainment and maintenance. These six areas reflect a programmatic approach for grouping initiatives under the EIP by connecting projects directly to the threshold benefits they produce. Each of the six areas of emphasis include specific goals, actions, funding needs, measures of progress, project development guidance, and monitoring needs.

### Committed and Unfunded Capital Costs 2008-2018 (in millions) as of December 2008



Unfunded	\$523	\$415	\$100	\$107	\$364
Committed	\$131	\$534	\$5	\$0	\$0
<b>Total Shares</b>	<b>\$654</b>	<b>\$949</b>	<b>\$105</b>	<b>\$107</b>	<b>\$364</b>



Bob Richards takes a water clarity measurement.

“Since 2001, we have had seven years in which Lake clarity has consistently been better than the long-term trend would have predicted. This is unprecedented.”

– Geoffrey Schladow, Director of the Tahoe Environmental Research Center, UC Davis.

**A Conservation Plan for Lake Tahoe:  
The Environmental Improvement Program**

- The EIP is a public-private partnership that rivals some of the largest collaborative restoration initiatives in the United States in its scope
- Approximately 300 EIP capital projects have been completed and hundreds more are in the planning and implementation stages
- The next phase of the EIP spans 10 years.

**EIP Research/Monitoring and Technical Assistance**

- Funded \$48 million in research/monitoring
- Established the Tahoe Science Consortium to better inform agency decision making
- Federal agencies have provided nearly \$15.5 million in technical assistance to EIP partners.

**Watersheds, Habitat, and Water Quality**

- Acquired 3,092 acres of sensitive land
- Improved over 13,927 acres for wildlife habitat
- Restored 739 acres of wetlands including 108 acres within the urban boundary
- Treated stormwater runoff from 26 miles of state highways, 323 miles of city/county roads, and 80 miles of US Forest Service lands
- Revegetated or removed 55 miles of dirt road in forests
- Completed and planned 25 projects to help restore the Upper Truckee River watershed which delivers more sediment into Lake Tahoe than any other tributary.

**Forest Management**

- Treated 33,549 acres to achieve ecosystem restoration and/or forest fuel reduction goals
- Revegetated 374 acres
- Completed the Lake Tahoe Basin 10-Year Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy which qualifies Lake Tahoe to receive federal funding.

**Air Quality and Transportation**

- Achieved a 20% reduction in vehicle traffic near Stateline, Nevada since 2001 because of transit-oriented redevelopment
- Constructed or rehabilitated 20 transit facilities and increased transit ridership to 1.5 million passengers annually
- Replaced 18 vehicles in the public transit fleet with clean-burning vehicles
- Constructed or planned 127 miles of new multi-purpose trails.

**Recreation and Scenic Resources**

- Constructed or rehabilitated 82 public facilities to increase accessibility and the quality of the recreational experience
- Relocated more than 7 miles of overhead utility lines underground along highway corridors
- Acquired 2,388 linear ft. of Lake shoreline for public access.

\* Accomplishments reported through 2009.

# ENVIRONMENTAL IMPROVEMENT PROGRAM UPDATE AT-A-GLANCE



## WATERSHEDS, HABITAT, AND WATER QUALITY

### Stormwater Management Program

- Reducing Stormwater Pollution from City and County Roads
- Reducing Stormwater Pollution from State Highways
- Reducing Stormwater Pollution from Forest Roads
- Retrofitting Public and Private Facilities

### Watershed Management Program

- Restoring the Upper Truckee Watershed
- Restoring California Priority Watersheds

- Restoring Nevada Priority Watersheds
- Acquiring Environmentally Sensitive Lands
- Enhancing Fish and Wildlife Habitat

### Threatened, Endangered, and Sensitive Species Program

- Implementing Tahoe Yellow Cress Conservation Strategy
- Restoring and Recovering Lahonton Cutthroat Trout
- Protecting Other Sensitive Species

### Invasive Species Program

- Controlling Invasive Terrestrial Species
- Managing Aquatic Invasive Species

## FOREST MANAGEMENT

### Forest Ecosystem Health and Hazardous Fuels Reduction Program

- Advancing Forest Ecosystem Health and Reducing Hazardous Fuels
- Utilizing Biomass from Forest Fuels Reduction

## AIR QUALITY AND TRANSPORTATION

### Air Quality and Transportation Program

- Improving Air Quality
- Improving Transit and Trails Connections

## RECREATION AND SCENIC RESOURCES

### Recreation Program

- Improving Lake Access
- Developing a Comprehensive Trail System
- Improving Recreation Facilities
- Improving Educational and Interpretive Programs and Facilities

### Scenic Program

- Improving the Scenic Quality of Roadway Units
- Improving the Scenic Quality of Shorezone Units

## APPLIED SCIENCE PROGRAM

- Monitoring Program
- Applied Research Program
- Data and Information Management and Reporting

## PROGRAM SUPPORT

### Program Support, Reporting, and Technical Assistance Program

- Technical Assistance and Public Education
- Annual Coordination and Reporting
- Operations and Maintenance of Capital Projects



**LAKE TAHOE EIP**  
CONSERVATION. CLEARLY.

# LOOKING FORWARD: KEY EIP GOALS 2008-2018



## WATERSHEDS, HABITAT, AND WATER QUALITY

- Enhance or restore stream environment zones (wetlands) in priority watersheds
- Treat 400 terrestrial and aquatic invasive species sites annually
- Retrofit 300 miles of roadways with water quality improvements to reduce fine sediment loading
- Improve and protect 346 acres of wildlife habitat
- Cut fine sediment and nutrient loading as part of the "Clarity Challenge" target of 78 feet of clarity by 2028
- Continue to acquire and restore priority environmentally sensitive lands to protect and conserve the natural environment
- Restore and recover a self-sustaining lake form of Lahontan Cutthroat Trout in Lake Tahoe and Fallen Leaf Lake.

## FOREST MANAGEMENT

- Treat 68,000 acres for forest fuel reduction and ecosystem restoration, as identified in the 10-Year Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy
- Reduce open pile burning and encourage utilization of 125,000 tons of biomass
- Improve 1,500 acres of SEZ aspen communities.

## AIR QUALITY AND TRANSPORTATION

- Construct 43 miles of bike and pedestrian trails to help reduce dependency on the private automobile as directed by the Bi-State Compact
- Increase transit ridership from 1.5 million passengers per year to more than 3 million
- Reduce road sanding
- Replace 10 street sweepers with innovative machines to reduce fine sediment loading from roadways into Lake Tahoe
- Initiate waterborne transit system.

## RECREATION AND SCENIC RESOURCES

- Complete 40 recreation rehabilitation or construction projects
- Under-ground 6 miles of overhead utilities
- Implement 500 projects to meet scenic quality standards along shoreline and scenic highways.

## APPLIED SCIENCE

- Refine and implement monitoring and evaluation programs to assess the status of environmental conditions and determine the effectiveness of EIP restoration projects
- Support applied research to understand causal relationships and quantitatively describe underlying ecosystem processes
- Improve data and information management to utilize web-based systems; develop and adopt standard operating procedures for seamless data analysis and public reporting.

## OTHER PROGRAM ELEMENTS

- Provide education and technical assistance to the public to advance the EIP and overall environmental stewardship
- Operate and maintain EIP projects to ensure performance of capital investments
- Provide program administration and tracking.



Left: US Senator John Ensign of NV at the annual Lake Tahoe Forum in 2009. Right: From left, US Senator Harry Reid of NV, US Senator Dianne Feinstein of CA, CA Secretary of Resources Mike Chrisman, Governor Jim Gibbons of NV and seated is US Secretary of Interior Dirk Kempthorne at the 12th annual Lake Tahoe August event held at the Valhalla Historic Site in 2008.

## CLIMATE CHANGE, SUSTAINABLE PLANNING, & THE EIP

Global climate change is projected to have unprecedented impacts on the health of the environment and economy in the Lake Tahoe Basin. As temperatures rise and more precipitation falls as rain rather than snow, management efforts to protect the Basin's forests, fish and wildlife, and fabled water clarity will face unique challenges.

These changes are already well documented:

- Evening ambient low temperatures in the Basin have risen more than 4 degrees Fahrenheit since 1911, while the number of days with average air temperatures below freezing has dropped from 79 days to 52 days since that time.
- In the last 10 years, the average surface water temperature of Lake Tahoe in July has increased by approximately 3 degrees Fahrenheit.
- Increased runoff, combined with warmer Lake temperatures, has fueled the growth of algae, which absorbs light and further reduces water clarity.
- The Lake is becoming more hospitable to invasive plants and fish, with warm-water species like bass and carp increasingly common.
- Across the Sierra Nevada, fires are starting earlier, burning longer and over larger areas, which threatens water quality, wildlife habitat, and rural and resort communities.

To address these impacts, the EIP partner agencies are formulating a Basin-wide strategy to address climate change. The strategy is intended to ensure that all major planning and regulatory programs at Lake Tahoe are designed to take into account the projected impacts of climate change. For example, future EIP water quality and erosion control projects may need to be designed for larger peak flows in the winter, and habitat improvement projects may need to take into account potential changes in the type, location, and distribution of vegetation communities.



Reducing greenhouse gas emissions benefits air and water quality as well as human health. At right: Tahoe Keys.



**Making Lake Tahoe more walkable and bicycle-friendly are important EIP goals.**

The climate change strategy will provide a starting point for sustainable decision making in the Tahoe Basin. These actions will be addressed in a combination of plans and programs, including the EIP, the Lake Tahoe Regional Plan Update, the Regional Transportation Plan, Community Plans, and local actions.

As part of this comprehensive strategy, the EIP will be broadly focused on maintaining healthy forest ecosystems and watersheds and on improving mobility and access with environmentally-friendly transit. Mandates and incentives to develop sustainably-designed communities, projects, and green infrastructure will be developed as part of the update of the TRPA Regional Plan.

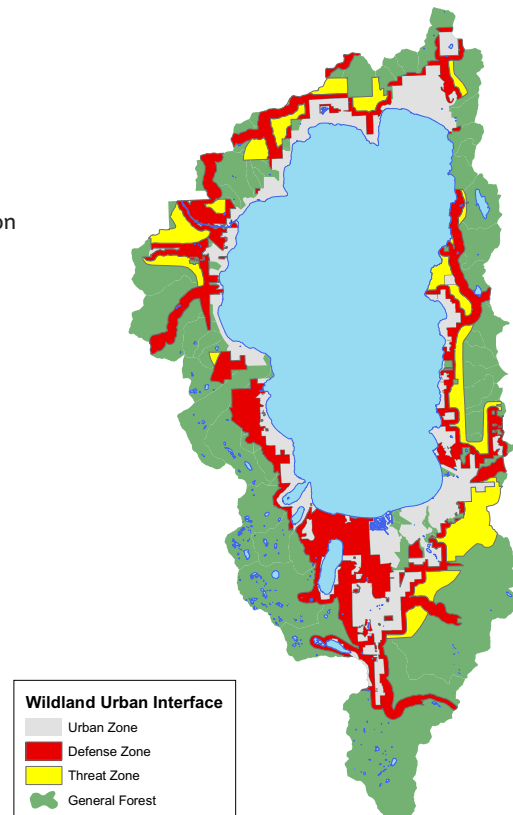
## FOREST MANAGEMENT AND WATERSHEDS

Forests will continue to be managed for ecosystem health and public safety purposes to reduce the threat of wildfire; this may in turn prevent the release of greenhouse gas (GHG) emissions during wildfires. Public land managers would use a science-based approach for restoration and management of the existing forests to minimize wildfires. Forest management will also consider what to do with forest fuels in a manner consistent with reducing GHG emissions.

Areas of significant disturbance would be improved through revegetation, restoration, and use of best management practices (BMPs). Forest fuel treatments within the wildland-urban interface (WUI) and communities will help reduce wildfire risk while considering scenic quality, proper soil and watershed function, water quality, and wildlife habitat. EIP programs will set out to make the Tahoe Basin a model of forest management for climate change mitigation and adaptation.

### Actions

- Reduce risk and severity of fires and catastrophic events
- Create forests that are resilient to rising temperatures, wildfire, changing hydrology, and insect outbreaks
- Revegetate disturbed areas and manage vegetation for adaptation to climate change
- Restore and improve habitats for fish and wildlife
- Control and reduce the spread of terrestrial and aquatic invasive species and infestations as the climate changes
- Restore watersheds for hydrologic function.







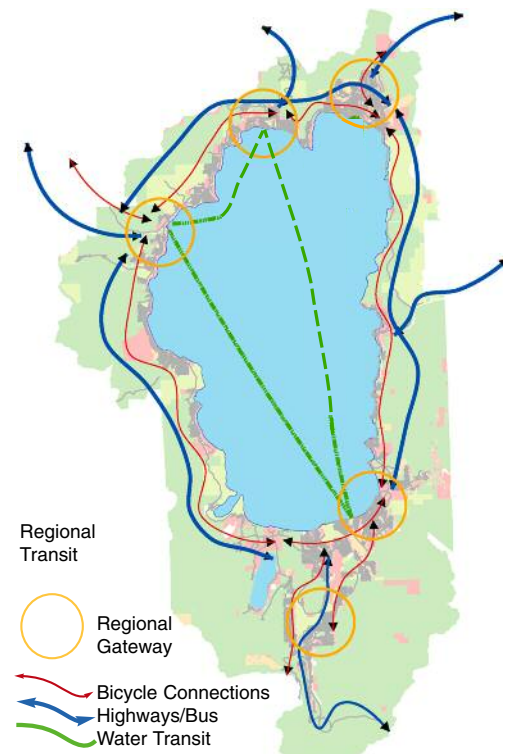
Transportation enhancements benefit multiple environmental thresholds.

## TRANSPORTATION AND ACCESS

In rural destinations similar to Lake Tahoe where large population bases are within a few hours by car, transportation is the largest contributor to the release of GHG. To address these effects, Basin communities and recreational destinations should be served by a centrally-managed transportation system. Consolidation of automobile travel for both visitors and commuters should be facilitated by various transportation options. Complete streets are a solution for connecting revitalized mixed-use centers, nodes, and neighborhoods. These streets would be tailored to meet the needs of each community. Other neighborhood specific solutions would include improved sidewalks and trail connections. This shift in travel patterns would provide multiple environmental improvements to air and water quality and reduced GHG. Improved connections and mobility options would help to reduce traffic volumes, year-round mobility, and an enhanced visitor experience.

### Actions

- Invest in environmentally-friendly transportation for public fleets
- Reduce dependence on the automobile by providing increased transportation options
- Improve the Basin's transit systems and reduce vehicle miles traveled (VMT) through Basin-wide bike trails, improved transit options, and waterborne transit networks
- Encourage pedestrian/transit-oriented redevelopment to reduce GHG emissions and VMT
- Shift to more efficient modes of transportation to improve quality of life while reducing GHG emissions
- Centralize cost-effective parking to encourage walking, bicycling, and local transit use which addresses specific needs of each Basin community
- Design complete streets to integrate pedestrian and non-auto-oriented facilities to reduce automobile traffic and related emissions, increase pedestrian safety, and provide opportunities for community interaction.

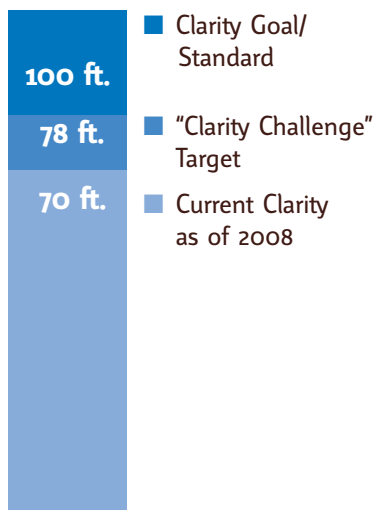




## WATERSHEDS, HABITAT, & WATER QUALITY

LAKE TAHOE OWES ITS REMARKABLE CLARITY TO SEVERAL FACTORS, including its great depth, volume, and the clean and clear runoff that flows into the Lake from the granitic soils and wetlands of its surrounding watersheds. Though Lake Tahoe’s waters remain pure compared to most water bodies, clarity has declined over the past 40 years.

### LAKE TAHOE CLARITY GOAL



The 1960 Squaw Valley Olympics spurred a building boom throughout the Tahoe Basin which continued throughout the 1970s. This building frenzy resulted in a precipitous decline in the Lake’s clarity because of increased runoff of fine sediment, nitrogen, and phosphorus into the Lake.

Everyone has a role to play in restoring Lake clarity—residents, visitors, businesses, and public agencies all share in the responsibility. By reducing erosion and restoring the health of the Basin’s watersheds, EIP water quality and watershed projects are the key to restoring the Lake’s breathtaking clarity.

# Stormwater Management

## STORMWATER MANAGEMENT PROGRAM

To date, EIP partners have invested more than half of EIP funds on projects to restore Lake clarity. Most projects addressed erosion control and source runoff improvements, as well as the implementation of Best Management Practices (BMPs) on developed properties. Because roadway runoff is one of the primary causes of clarity loss, two-thirds of the water quality projects under the updated EIP focus on stormwater management. EIP partners will prioritize stormwater treatment in urban core areas since these areas are the primary source of fine sediment loading into the Lake.

### Primary Threshold Categories Improved by Program Objectives

 Water Quality	 Recreation
 Air Quality	 Fisheries and Wildlife
 Soil Conservation	 Noise
 Scenic Quality	 Vegetation

### Program Elements

The goal of the stormwater management program is to reduce the amount of fine sediment particles entering Lake Tahoe. Stormwater management consists of the following four programs:

- Reducing Stormwater Pollution from City and County Roads
- Reducing Stormwater Pollution from State Highways
- Reducing Stormwater Pollution from Forest Roads
- Retrofitting Public and Private Facilities with Best Management Practices

Stormwater management projects incorporate stormwater drainage conveyance, treatment facilities, and source control measures for effectively reducing runoff and improving Lake water quality. Property/easement acquisitions and public-private partnerships are important elements of these projects because in many cases sufficient space does not exist within road rights-of-way for water quality projects to be constructed. Improved project level monitoring will help evaluate the effectiveness of different stormwater strategies and improve project implementation in the future. For example, studies are underway to explore area-wide runoff treatment systems which could be used in the future.

### Adapting to Climate Change

Climate change and water quality models for the Lake Tahoe region predict that as more precipitation falls as rain rather than snow, peak stormwater flows may increase. As a result, EIP water quality and erosion control projects may need to be designed for larger winter runoff and peak flows.

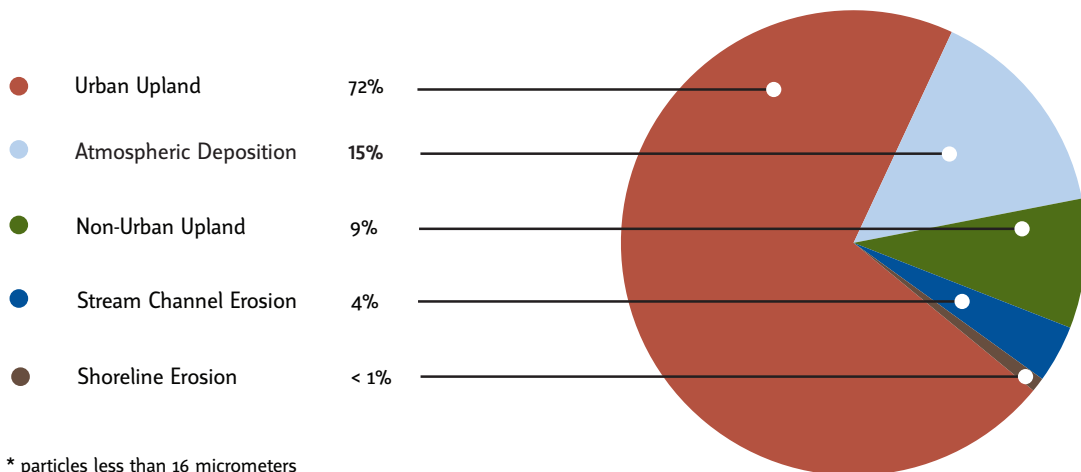
# Science Drives Water Quality Program

**TMDL:** The Total Maximum Daily Load is a water quality restoration plan led by the states of California and Nevada, to determine the maximum amount of pollutants that Lake Tahoe can absorb while meeting water quality standards. The EIP Update relies on science gleaned from the TMDL effort to prioritize water quality programs and projects.

The Lake Tahoe TMDL water quality restoration plan reflects a \$10 million investment in the work of more than 200 professionals and scientists who have analyzed 40 years of data on the Lake and its tributaries. Scientists developed two models: the watershed and the clarity models. The three primary pollutants causing clarity loss in Lake Tahoe are nitrogen, phosphorus, and fine sediment particles. The watershed model identifies the sources of these pollutants by land-use category and helps guide the community and decision makers in implementing informed policy choices and assessing the cost-effectiveness of implementation strategies.

The bottom line: fine sediment particles are the number one culprit in the clarity loss equation. As shown below, 72 percent of these particles are coming from developed areas. Roads and other impervious areas act both as sources of pollutants, and as conveyor belts, depositing fine sediments into the Lake from urban upland areas. These lands cover less than five percent of the land area in the Tahoe Basin. Reducing the amount of fine sediment particles entering the Lake has the most potential for helping to reverse clarity loss. The TRPA Regional Plan Update, which includes the EIP, will contain implementation strategies, including regulations and incentives, to achieve an interim clarity target of about 80 feet. To reach this clarity target, EIP partners must take actions to achieve a 34 percent reduction in fine sediment particles from 2004 levels as well as reductions in nitrogen and phosphorus. This target is an important EIP goal and will be challenging. However, for the first time ever, we know it's scientifically possible and recent clarity data show we're moving in the right direction.

**SOURCES OF FINE SEDIMENT PARTICLES ENTERING LAKE TAHOE \***



\* particles less than 16 micrometers

Figure courtesy of the Lahontan Regional Water Quality Control Board and the Nevada Division of Environmental Protection.



## REDUCING STORMWATER POLLUTION FROM CITY AND COUNTY ROADS

### PRIMARY IMPLEMENTING AGENCIES:

City of South Lake Tahoe, Douglas County and General Improvement Districts, El Dorado County, Placer County, Washoe County

There are more than 550 miles of local roads in the Tahoe Basin and most were developed without curbs, gutters, or other streetscape improvements to capture fine sediment and other pollutants before they reach Lake Tahoe. Reducing runoff from these roads is a top priority of the City of South Lake Tahoe and each of the five counties surrounding the Lake. Erosion control projects and advance treatment methods are implemented to reduce both the volume of water running off these roadways, and the amount of fine sediment, nitrogen, and phosphorus discharging into Lake Tahoe.

On the California side of the Basin, there are 423 miles of county and city streets. On the Nevada side, there are 140 miles of county streets. Roadways transport polluted stormwater into streams, roadside ditches, and other areas which ultimately drain into Lake Tahoe. Sand and cinders applied to roads during winter months contribute additional fine sediments to stormwater. Local governments are developing advanced treatment methods to meet water quality goals and projects to reduce the volume of water running off these roadways and the amount of fine sediment and other pollutants they transport into the Lake.

### Goal

To reduce erosion and stormwater runoff from local roads.



Municipal stormwater systems can help reduce pollution at the Lake by capturing and filtering runoff.

### Priority Projects

- Curbs, gutters, rock-lined channels, bioswales, infiltration basins and other improvements that capture runoff from developed neighborhoods
- Pump and treatment facilities, where necessary, may be implemented to address area-wide runoff
- Acquisitions of property and easements beyond the right-of-way to more effectively reduce or treat runoff
- Monitoring and assessment programs to evaluate the effectiveness of control measures
- Operations and maintenance activities to maintain performance of facilities.

### Accomplishments to Date

To date, EIP partners have retrofitted 323 miles of county and city roads with stormwater quality improvements.

### Unfunded Need for Reducing Stormwater from City and County Roads (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$81.92	\$82.63	\$20.09	\$48.79	n/a	\$233.43

These shares represent the capital improvement costs only and future operating and maintenance costs for the local jurisdictions are projected to be an additional \$18.5 million. A private share is not included since these projects are located along public roadways. However, private sector contributions for water quality improvement total \$204.8 million and are identified in the BMP Retrofits on Private and Public Parcels program.



# REDUCING STORMWATER POLLUTION FROM STATE HIGHWAYS

## PRIMARY IMPLEMENTING AGENCIES:

California Department of Transportation, Nevada Department of Transportation

**W**ater volume and stormwater runoff from state highways is a major contributor to Lake Tahoe's clarity decline. The Lake Tahoe TMDL identifies the pressing need to address this runoff in order to achieve water quality standards at Lake Tahoe. The California Department of Transportation (Caltrans) and Nevada Department of Transportation (NDOT) projects will reduce both the volume of water and the amount of fine sediment, nitrogen, and phosphorus from the state highway network that drains into Lake Tahoe.

There are more than 100 miles of state highways within the watershed. Of this, 64 miles are on the California side of Lake

Tahoe, and 40 miles on the Nevada side. Because state highways typically are much wider than local roads, they produce greater volumes of stormwater runoff per mile of road than do local streets. Caltrans and NDOT also apply large quantities of sand and cinders to highways during

winter months to help prevent vehicle accidents. Although street sweepers are used on roadways to capture these abrasives, large quantities still end up in the Lake.

### Goal

To reduce erosion and stormwater runoff from state highways.

## Priority Projects

- Curbs, gutters, rock-lined channels, bioswales, infiltration basins and other improvements that capture runoff from the highway corridor
- Pump and treatment facilities where necessary to address area-wide runoff



Many of the Basin's roads and highways drain directly into the Lake and require water treatment upgrades.

- Acquisition and easements of property beyond the right-of-way to more effectively reduce or treat runoff
- Reductions and improved collections of sand and cinders applied in winter months
- Monitoring and assessment programs to evaluate the effectiveness of these projects
- Operation and maintenance activities to maintain their optimal performance.

TMDL science identified stormwater treatment throughout the road network as imperative to achieving water quality standards at Lake Tahoe

## Accomplishments to Date

To date, 26 miles of California and Nevada highways have been retrofitted with BMPs. In the next decade, Caltrans and NDOT intend to treat most of the rest of the state highway network in the Basin.

### Unfunded Need for Reducing Stormwater from State Highways (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$36.6	\$27.44	\$46.4	n/a	n/a	\$110.44

Funding responsibility for this program is primarily assumed by federal and state entities. The federal share includes the different funding programs of the Federal Highway Administration (FHWA). Local and private funding contributions for stormwater management are shown in other program areas.



# REDUCING STORMWATER POLLUTION FROM FOREST ROADS

**PRIMARY IMPLEMENTING AGENCIES:**  
US Forest Service

The National Forest road network at Lake Tahoe provides important forest management and recreational access to National Forest System Lands. Many of these roads are not paved, however, and contribute dust and stormwater runoff to Lake Tahoe and its tributaries. This program includes retrofit and/or removal of certain roads to reduce stormwater runoff. National Forest System Lands in the Tahoe Basin are managed by the Lake Tahoe Basin Management Unit and contain approximately 240 miles of forest system roads. Some of these forest roads are located in sensitive areas with steep slopes. Others are

located near streams and water bodies. Runoff from these roads erodes hillsides and drains into Lake Tahoe. The US Forest Service uses a systematic approach in managing runoff from these roads.



Roads on forest lands are retrofitted with erosion control measures under the EIP.

*Goal*  
To reduce erosion and stormwater runoff from Forest Service roads.

The focus of this program is to implement water quality projects that incorporate drainage conveyance and treatment facilities as well as source control measures and stream-crossing improvements.

## Priority Projects

- Installing rock-lined roadside channels, replacing culverts at stream crossings, building infiltration basins and other treatment facilities, vegetating hillsides, and other stormwater improvements
- Decommissioning roads which no longer serve important recreational or forest management uses.

## Accomplishments to Date

The US Forest Service has decommissioned approximately 160 miles of roads since 1998 in the Lake Tahoe Basin, reducing the road network from 400 to the current 240 miles. Of these 240 miles, more than 80 miles has been retrofitted with water quality Best Management Practices. Numerous stream crossings have been reconstructed with larger drainage pipes or bridges. Four bridges have been constructed to restore healthier stream function.

Unfunded Need for Reducing Stormwater from Forest Roads (in millions)					
Federal	State of CA	State of NV	Local	Private	Total
\$7.17	n/a	n/a	n/a	n/a	\$7.17

Forest roads in this program are associated with the National Forest system roads and all resources dedicated to this effort are currently designated as a federal share. State, local and private contributions toward reducing stormwater from forest roads are captured in other program areas.



## RETROFITTING PUBLIC AND PRIVATE FACILITIES WITH BEST MANAGEMENT PRACTICES

### PRIMARY IMPLEMENTING AGENCIES:

Private Property Owners, Local Government Jurisdictions, Nevada Tahoe Conservation District, Public Land Management Agencies, Tahoe Resource Conservation District

**R**unoff from public and private developed land is one of the largest sources of fine sediment and other pollutants in Lake Tahoe. Most of the rain and snow that falls on impervious surfaces on these lands (i.e., rooftops, driveways and parking areas) runs off and flows into roadside drainage channels. This runoff then combines with stormwater from public roads to produce a large volume of water containing nitrogen, phosphorus, and fine sediment that drains into the Lake.

Best Management Practices (BMPs) are the first line of defense to reduce stormwater runoff from developed properties. They include vegetating bare soils, building infiltration trenches, paving dirt roads and driveways, and other improvements that capture and reduce runoff to adjacent roads or properties.

*Goal*  
To reduce erosion and stormwater runoff from public and private facilities.

The Regional Plan for the Lake Tahoe Basin adopted by TRPA requires all public and private property owners to install BMPs on their lands and facilities. This investment is the largest source of the private share of EIP funding.

The focus of this program is retrofitting developed public and private land with erosion control measures, known as BMPs, in order to help keep runoff from entering roadways and ultimately Lake Tahoe.

### Priority Projects

- Assisting public and private property owners with BMP inspections, installations, and certifications
- Establishing public outreach programs to educate homeowners and businesses
- Developing incentives and other strategies to integrate water quality BMPs with defensible space requirements
- Coordinating and integrating residential BMPs with city and county stormwater improvement projects.

### Accomplishments to Date

As of December 31, 2008, 10,457 properties, or roughly 25 percent of the 43,470 residential, commercial, and industrial parcels in the Basin, have been retrofitted with BMPs. In Nevada, the compliance rate is 46 percent overall, with a 50 percent compliance rate in the Priority One Watershed area of Incline Village. In California, however, only 16 percent of the parcels have been retrofitted.



These examples show completed erosion control work on residential parcels.

### Unfunded Need for BMP Retrofits on Private and Public Parcels (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$60.4	\$16.81	\$1.6	\$14.4	\$204.8	\$298

All entities have a responsibility to implement BMPs on their facilities to improve water quality by addressing stormwater flows.



# Watershed Management

## WATERSHED MANAGEMENT PROGRAM

The Lake Tahoe Basin's watersheds and stream environment zones have been significantly impacted by growth and development. The watershed management program is an integrated approach designed to improve Lake clarity, restore stream environment zones, and make progress on vegetation, soils, wildlife and fisheries environmental threshold standards. Restoration of these riparian areas is essential to improve Lake clarity by filtering runoff.

Many of the Lake Tahoe watersheds and aquatic habitats are degraded. Many streams no longer function properly as a result of past or ongoing human activities. Poorly functioning streams contribute significant quantities of sediment and nutrients to the Lake. Land use practices within watersheds have also led to increased sedimentation and stream channel alteration which has damaged aquatic habitats.

EIP partners will assess watershed conditions to identify and prioritize individual projects. In most watersheds, projects are needed to improve the geomorphic function and floodplain connectivity of streams. Projects are designed to replenish overdrafted groundwater tables and restore native vegetation, as well as implementing BMPs to reduce sediment and nutrient loading in non-urbanized sections of watersheds. EIP projects also focus on enhancement of specific aquatic habitat types or the processes that create and maintain those habitat types. Projects will remove, improve, or replace structures such as culverts, dams, or bridges that create movement barriers for aquatic species or reduce the hydrologic function of streams. Revegetation is needed to stabilize stream banks and restore floodplains. Public acquisition of sensitive lands will help ensure that private development does not disproportionately impact the watershed. These restoration projects benefit all environmental thresholds and are the most cost-effective methods to reduce pollutant loading to the Lake, according to TMDL data.

### Primary Threshold Categories Improved by Program Objectives

- |   |  |
|---|--|
|  Water Quality     |  Recreation             |
|  Air Quality       |  Fisheries and Wildlife |
|  Soil Conservation |  Noise                  |
|  Scenic Quality    |  Vegetation             |

Individual watersheds have been prioritized based on the degree to which they are degraded and the extent to which they pollute Lake Tahoe as indicated by the Lake Tahoe TMDL Technical Report. On the California side, tributaries depositing the most sediment into Lake Tahoe are the Upper Truckee River, Blackwood Creek, and Ward Creek. On the Nevada side, high-priority creeks and watersheds with similar types of degradation are targeted for restoration: Third, Rosewood, and Edgewood Creeks. In addition to physical management of watersheds, the EIP includes programs for public acquisition of environmentally sensitive land in multiple watersheds.

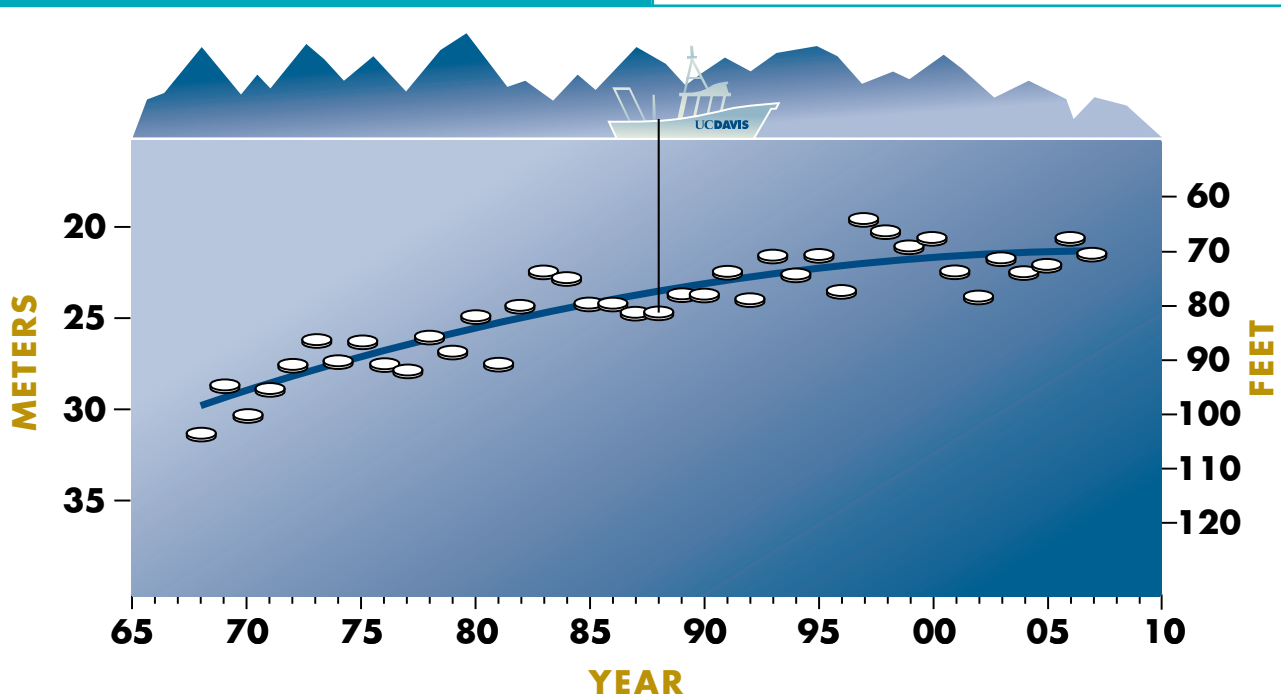
### Program Elements

- Restoring the Upper Truckee Watershed
- Restoring California Priority Watersheds
- Restoring Nevada Priority Watersheds
- Enhancing Fish and Wildlife Habitat
- Acquiring Environmentally Sensitive Land

### Adapting to Climate Change

Climate change and water quality models for the Lake Tahoe region predict that as more precipitation falls as rain rather than snow, peak flows may occur earlier and with higher frequency. As a result, EIP watershed management projects may need to be designed for increased winter runoff, changing hydrology, and changes to soils, vegetation, and habitat resources.

WATER CLARITY TREND AT LAKE TAHOE 1968-2007



Data Source: Annual Secchi Disk Measurements, UC Davis, Tahoe Environmental Research Center.

**Secchi disk:** Named for Father Pietro Angelo Secchi, an astronomer among the first to test the instrument when he lowered it into the Mediterranean Sea in 1865. At present, UC Davis researchers test Lake Tahoe's clarity every 7-10 days year-round by submerging the Secchi disk into the water and recording the depth at which the disk disappears.



## RESTORING THE UPPER TRUCKEE WATERSHED

### PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, California State Parks, City of South Lake Tahoe, El Dorado County, US Forest Service

The Upper Truckee watershed is the largest in the Tahoe Basin, draining more than 54 square miles. Urbanization within this watershed has disturbed its natural ability to filter pollutants before they make their way into Lake Tahoe. As a result, the watershed is the single largest source of fine sediment and nutrients flowing into Lake Tahoe, annually transporting some 2,078 tons of sediment, or about two-thirds of the total amount reaching the Lake.

The Upper Truckee watershed was once a major fishery supporting Lahontan Cutthroat Trout (LCT) and mountain whitefish. This fishery has been replaced by introduced species, including rainbow, brown, and brook trout. River and stream fish habitat is in poor condition because of the influx of sediment, loss of riparian plant cover, reduction in macroinvertebrate populations and stream-channel widening.

Structures such as bridges and culverts have created barriers to fish migration, preventing fish access to several miles of remaining spawning habitats in the upper watershed. The US Forest Service, the Army Corps of Engineers, the California Tahoe Conservancy, California State Parks, and the City of South Lake Tahoe are developing a large-scale restoration program to restore the natural channels and floodplains of the Upper Truckee River. This collaborative, interagency effort is one of the largest and most extensive watershed restoration efforts in the Basin.

*Goal*  
To restore or enhance the natural functions and processes of the Upper Truckee River and its connecting floodplain.



The Upper Truckee River is the number one contributor of fine sediments to Lake Tahoe.

### Priority Projects

- Upper Truckee Marsh
- Airport Reach
- Meadow Reach
- Sunset Reach
- Golf Course Reach

### Accomplishments to Date

Completed projects include the restoration of Dunlap, Cold, Angora, Industrial, and Trout Creeks and portions of the Upper Truckee River.

Unfunded Need for Restoring the Upper Truckee Priority Watersheds (in millions)					
Federal	State of CA	State of NV	Local	Private	Total
\$32.85	\$40.7	n/a	n/a	n/a	\$73.55

Federal and state partners will restore the vitality of Lake Tahoe through land conservation, acquisitions, and restoration projects within the Upper Truckee Watershed. The Upper Truckee Watershed is located in California and therefore no cost share for Nevada is shown. Determinations of local and private shares occur at the project level and will be reported as projects are implemented.



## RESTORING CALIFORNIA PRIORITY WATERSHEDS

### PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, California State Parks, City of South Lake Tahoe, El Dorado County, Placer County, US Forest Service

In addition to restoring the Upper Truckee River watershed, EIP partners are also working to restore several other high priority watersheds on the California side of the Basin that support fish and wildlife habitat. These watersheds have altered hydrologic function and contribute high levels of fine sediment and other pollutants to Lake Tahoe. Projects are prioritized based on the highest level of environmental benefit and cost effectiveness.

### Priority Projects

- Blackwood Creek, which covers 11 square miles on the west side of the Tahoe Basin and is the highest per-acre contributor of fine sediments and nutrients to Lake Tahoe
- Ward Creek, a 10-square mile watershed and the third highest contributor of runoff to the Lake
- The Meeks Creek watershed covers 8.8 square miles on the west shore and is a major contributor of nutrients and sediments to Lake Tahoe
- SEZs within Taylor, Tallac, and Spring Creek watersheds along the south shore which are heavily impacted by grazing, logging, road construction, and other physical and structural developments.

### Goal

To restore or enhance the natural functions and processes of streams and their floodplains in CA priority watersheds.



Cove East Restoration Project, South Lake Tahoe, CA.

### Accomplishments to Date

The US Forest Service has completed several projects on the **Blackwood Creek watershed** to remediate the effects of gravel mining adjacent to the stream channel, and to replace an under-sized bridge that created a barrier to fish migration and hydrologic function.

EIP partners completed a comprehensive watershed assessment of **Ward Creek watershed** to develop restoration plans and priorities, and removed a dam that had been a major barrier to fish passage.

The US Forest Service completed a comprehensive assessment of **Meeks Creek and Cold Creek watersheds**, and are now planning and implementing restoration improvements.

### Unfunded Need for Restoring California Priority Watersheds (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$27.36	\$22.42	n/a	n/a	n/a	\$49.78

Funding responsibility for this program is primarily assumed by federal and state entities. However, there may be opportunities for local and private involvement as projects are further scoped and defined and those contributions will be reported as projects are implemented.



## RESTORING NEVADA PRIORITY WATERSHEDS

### PRIMARY IMPLEMENTING AGENCIES:

Incline Village General Improvement District, Nevada Division of State Lands, Nevada State Parks, Nevada Tahoe Conservation District, Washoe County

Several Nevada watersheds are high priorities for restoration. The interruption of natural hydrologic processes and the resulting influx of nutrients and sediment have degraded the quality of these watersheds and have impacted water quality, fisheries, stream environment zones and wildlife habitat. Other impacts such as logging, grazing, road construction, residential and commercial development, recreational roads and trails, golf courses and ski resorts have also contributed to the degradation of these watersheds.

*Goal*  
To restore or enhance the natural functions and processes of streams and their floodplains in NV priority watersheds.

The focus of this program is to improve water quality; restore natural biological, physical, and chemical processes in streams, SEZs and floodplains; and improve the aquatic wildlife habitat. Watershed assessments will continue to be used to identify and prioritize projects.

### Priority Projects

These watershed restoration projects would help restore fish and wildlife habitat, filter pollutants, and capture and treat runoff. Runoff from these watersheds is a major contributor of fine sediment that affects Lake clarity.

- Burke Creek
- Edgewood Creek
- Incline Creek
- North Canyon Creek
- Third Creek



### Accomplishments to Date

EIP partners have completed restoration projects on Second Creek, Rosewood Creek and Incline Creek. In addition, partners developed a watershed plan for the Edgewood Creek watershed which identifies future restoration opportunities.

At left: Water quality projects like this one in Incline Village, NV strive to achieve multiple environmental benefits for Lake Tahoe. At right: Flow measurement device at Village Green Pond, Incline Village, Nevada.

Unfunded Need for Restoring Nevada Priority Watersheds (in millions)					
Federal	State of CA	State of NV	Local	Private	Total
\$3.25	n/a	\$9.9	n/a	n/a	<b>\$13.15</b>

Funding responsibility for this program is primarily assumed by federal and state entities. However, there may be opportunities for local and private involvement as projects are implemented.



## ACQUIRING ENVIRONMENTALLY SENSITIVE LANDS

### PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, US Forest Service

Public acquisition and restoration of sensitive lands serves as a tool to help accomplish the EIP goals of protecting and maintaining watersheds and providing recreational opportunities in the Tahoe Basin. Since 1982, the US Forest Service, California Tahoe Conservancy, and Nevada Division of State Lands have acquired and protected more than 20,000 acres of sensitive lands, comprised of more than 10,000 vacant lots in residential areas throughout the Basin. By acquiring sensitive lands, these agencies have

preserved open space, created water quality benefits, provided alternatives to landowners who are unable to develop these lands, and protected the integrity of cultural and historic resources.

The focus of this program is to protect and enhance meadows, wetlands, rivers, streams; to provide a land base

for stormwater quality projects; and to reduce the development potential within the Lake Tahoe Basin by approximately 20 percent. Additionally this program will increase public ownership and access to the shoreline of Lake Tahoe while protecting and enhancing scenic resources.

### Priority Projects

- EIP partners are continuing to seek opportunities, on a willing-seller basis, to purchase environmentally sensitive lands that would further the goals of the EIP
- Priorities include parcels in key watersheds and in undeveloped subdivisions.

### Accomplishments to Date

Since 1997, more than 3,092 acres have been acquired by state and federal agencies in the Basin. Significant acquisitions during this period include more than 300 acres and 2,600 feet of lakefront at the Upper Truckee Marsh, more than 1,800 acres associated with High Meadows and recently 754 acres surrounding Incline Lake in Nevada.

#### Goal

To acquire and restore priority environmentally sensitive lands.



Restored meadows and wetlands like these provide critical habitat for wildlife and benefit water quality.

### Unfunded Need for Acquiring Environmentally Sensitive Lands (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$47.6	\$19.33	n/a	n/a	n/a	\$66.93

Currently, only the state of California and the federal government have acquisition programs in place. Nevada acquisitions are largely completed.



## ENHANCING FISH AND WILDLIFE HABITAT

### PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, Nevada Division of Wildlife, Nevada Tahoe Resource Team, US Fish & Wildlife Service, US Forest Service

The Tahoe Basin contains a rich diversity of fish, wildlife, and native plants that are an integral part of the ecosystem at Lake Tahoe. Land development and road construction have impacted and modified the natural landscape in the Basin, reducing, fragmenting, and degrading habitat and migration corridors for these species. Today's forested landscapes are overstocked, composed primarily of second-growth trees and lack the diversity needed to support healthy wildlife populations. As a result,

### Goal

To enhance fish and wildlife lake habitat associated with fish and wildlife movement corridors.

wildlife species in the Lake Tahoe Basin are being impacted by a loss of habitat including key habitat types necessary for food, cover or reproduction.

This program will focus on enhancing the biologic integrity of ecosystems to improve the environmental conditions necessary for the full range of

species to help compensate for past degradation. EIP partners will coordinate fish and wildlife habitat enhancement projects with vegetation and forest fuels management projects to ensure that multiple environmental benefits can be gained. Priorities will be based on: type of habitat to be restored, potential for further degradation, status of species likely to benefit, compatibility with other EIP programs, and cost effective implementation.

### Priority Projects

- Acquiring and protecting a wide variety of habitat types
- Removing and/or rerouting roads and trails
- Creating wildlife connectivity corridors surrounding urbanized areas



Survival of the Northern Goshawk requires careful habitat protection at Lake Tahoe.

- Reestablishing and creating migration corridors
- Increasing the diversity of forest vegetation.

### Accomplishments to Date

EIP partners have enhanced 13,450 acres of valuable wildlife habitat and protected 606 acres of critical habitat through public acquisition.



The old-forest dependent California Spotted Owl is listed as a "Sensitive Species" by the US Forest Service. Forest treatments implemented in the Basin are designed to promote habitat conditions important for this species.

### Unfunded Need for Enhancing Fish and Wildlife Habitat (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$4.09	\$3.85	\$1.76	n/a	n/a	\$9.7

Funding responsibility for this program is primarily assumed by federal and state entities as most opportunities exist on public land. Enhancing both fish and wildlife habitat are often components of larger watershed restoration or forest management activities. Determinations of local and private shares occur at the project level and will be reported as projects are implemented.

# *Threatened, Endangered, and Sensitive Species*

## THREATENED, ENDANGERED, AND SENSITIVE SPECIES PROGRAM

The Lake Tahoe Basin is home to many special status plant and animal species, including federal, state, and regionally listed threatened, endangered, or petitioned species. These species are considered sensitive because of low population sizes or distribution, declining abundance, or other factors that place them in peril. EIP partners will seek to protect and expand (in appropriate locations) habitats of special status species populations and communities of concern to improve the habitats and environmental conditions these species require.

### Program Elements

EIP projects will enhance all 21 special status species in the Tahoe Basin. The primary focus will be:

- Implementing the Tahoe Yellow Cress Conservation Plan
- Restoring and Recovering Lahontan Cutthroat Trout
- Protecting Other Priority Sensitive Species

### Primary Threshold Categories Improved by Program Objectives

 Water Quality	 Recreation
 Air Quality	 Fisheries and Wildlife
 Soil Conservation	 Noise
 Scenic Quality	 Vegetation

### Adapting to Climate Change

Climate change models for the Lake Tahoe region predict that in the future more precipitation will fall as rain rather than snow. This may cause changes to the terrestrial and aquatic habitats that support Tahoe Yellow Cress, Lahontan Cutthroat Trout, and other priority sensitive species. As a result, the programs that support these species may need to change management strategies to meet this additional challenge.





# IMPLEMENTING THE TAHOE YELLOW CRESS RECOVERY PLAN

## PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, Nevada and California State Parks, Nevada Division of Forestry, Private Property Owners, US Fish & Wildlife Service, US Forest Service

Lake Tahoe is the only place in the world where the Tahoe Yellow Cress (TYC) species (*Rorippa subumbellata*) is located. This rare plant grows along the shoreline and is listed as critically endangered by the state of Nevada, endangered by the state of California, and is a candidate for federal listing under the Endangered Species Act. Because of concern for this unique species, multiple agencies collaborated on a conservation plan in 2002. The TYC Conservation Strategy serves as guidance for all research, protection and conservation activities for the species. The primary objective of this program is to de-list TYC through the development of additional conservation measures and mitigation techniques.

*Goal*  
To protect and conserve Tahoe Yellow Cress.

## Priority Projects

- Protecting current populations and their habitats from disturbance
- Conducting research that supports the management and restoration of TYC
- Establishing new areas that could support additional populations
- Implementing other activities consistent with the TYC Conservation Strategy.

## Accomplishments to Date

EIP partners and other entities completed and adopted a conservation strategy in 2002. Based on that strategy, agencies have implemented conservation measures, identified additional key research and management questions, and developed an adaptive-management program to measure the effectiveness of implementation activities. EIP partners have also conducted experimental reintroductions. Because of these efforts, existing TYC populations are protected and new populations are growing.



Reestablishment of sensitive plants such as the Tahoe Yellow Cress pictured here is a top priority of the EIP.

Unfunded Need for Implementing Tahoe Yellow Cress (in millions)					
Federal	State of CA	State of NV	Local	Private	Total
\$0.72	\$0.8	\$0.1	n/a	n/a	\$1.62

Funding responsibility for this program is primarily assumed by federal and state entities while recognizing that the opportunities for restoration activities would also affect a combination of both public and private lands. Any local or private funds expended as part of this programmatic implementation would be documented and reported as projects are implemented.



## RESTORING AND RECOVERING LAHONTAN CUTTHROAT TROUT

PRIMARY IMPLEMENTING AGENCIES:  
US Fish & Wildlife Service, US Forest Service

The Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*) once flourished in Lake Tahoe's waters, but no populations have been found in the Lake since the 1930s. The species is federally listed as threatened under a special rule that permits recreational harvest under state fishing regulations. The Lahontan Cutthroat Trout (LCT) Recovery Plan, finalized in 1995, provides a framework for reintroduction and recovery activities.

The focus of this program is to restore and recover a self-sustaining lake form of Lahontan Cutthroat Trout in Lake Tahoe and Fallen Leaf Lake. The reestablishment of the LCT will support a popular recreational fishery in the Basin.

### Priority Projects

- Maintaining and evaluating the successful reintroduction of the LCT in the Upper Truckee River and Fallen Leaf Lake
- Conducting additional research to evaluate the most promising means of reintroduction to Lake Tahoe
- Other activities consistent with the Lahontan Cutthroat Trout Recovery Plan.

#### *Goal*

To restore and recover a self-sustaining lake form of Lahontan Cutthroat Trout in Lake Tahoe and Fallen Leaf Lake.



It is important that native fish populations once again take hold in the Tahoe Basin.

### Accomplishments to Date

The Lahontan Cutthroat Trout has been successfully reintroduced into the Upper Truckee River and Fallen Leaf Lake, and is currently maintained by hatchery propagation of a strain of the fish that originates from the indigenous Lake Tahoe population. EIP partners completed the first phase of research in Fallen Leaf Lake as identified in the LCT Recovery plan.

### Unfunded Need for Restoring and Recovering Lahontan Cutthroat Trout (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$18.06	\$2.86	n/a	n/a	n/a	\$20.92

The state of California and the federal government will implement the Lahontan Cutthroat Trout Recovery Plan. Shares for the state of Nevada, local and private sectors are not identified.



## PROTECTING OTHER PRIORITY SENSITIVE SPECIES

### PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, California State Parks, Nevada Division of State Lands, Nevada Department of Wildlife, US Forest Service

The Lake Tahoe Basin provides habitat for numerous other priority and special status species. Protecting, enhancing, and restoring these species and their habitats is a high priority for EIP partners in achieving the environmental standards of the Lake Tahoe Regional Plan.

Other priority and special status species to be addressed include, but are not limited to:

- California spotted owl (*Gambelia silus*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Osprey (*Pandion haliaetus*)
- Lake Tahoe draba (*Draba asterophora*)
- Mountain beaver (*Aplodontia rufa*)
- Trowbridge's shrew (*Sorex trowbridgii*)
- Northern goshawk (*Accipiter gentilis*)
- Native amphibians including the mountain yellow-legged frog (*Rana muscosa*)
- Migratory birds and other native mammals, such as American marten.

The focus of this program is to protect species by implementing conservation measures, acquiring important habitat and managing human disturbances and impacts.



Osprey at Lake Tahoe.

### Priority Projects

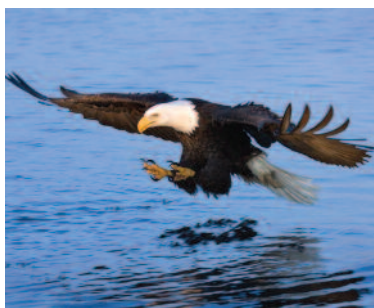
- Acquiring and protecting a wide variety of habitat types
- Removing and/or rerouting roads and trails
- Creating wildlife connectivity corridors surrounding urbanized areas
- Reestablishing and creating migration corridors
- Increasing the diversity of forest vegetation.

### Accomplishments to Date

EIP projects have rerouted trails on public lands to reduce impacts on sensitive species. Restoration in stream environment zones and other areas has increased habitat quality and the protection of breeding sites continues.

**Bald eagles have consistently nested on the shoreline of Lake Tahoe over the last 10 years.**

*Goal*  
To protect critical habitat needed by other sensitive species



### Unfunded Need for Protecting Other Priority Sensitive Species (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$4.85	\$2.32	\$0.68	n/a	n/a	\$7.85

Funding responsibility for this program is primarily assumed by federal and state entities. Enhancing both fish and wildlife habitat for the protection of sensitive species is often a component of larger watershed restoration or forest management activities. Although not anticipated, local and private shares would be reported as projects are implemented.

# *Invasive Species*

## INVASIVE SPECIES PROGRAM

Invasive species pose a major threat to ecosystem health in the Tahoe Basin. Past resource management practices, including fire suppression, grazing, development, and logging have significantly altered native habitats. In their altered state, ecosystems are less able to support wildlife and are unable to adequately respond to natural or imposed disturbances.

These degraded ecosystems face a growing threat from invasive species, which can replace native species, alter natural balances and significantly reduce habitat for other plant and animal species. The environmental and economic impacts of these invasions could be substantial as they crowd out native populations, impair habitats and water quality, and reduce recreational opportunities.

The primary focus of this program is to improve the biological integrity of ecosystems in the Basin, and in doing so ensure the existence of a full range of native species, seral stages, habitats, and ecological processes. Achieving these goals will require a coordinated effort between multiple entities to reduce impacts from non-native species, reduce direct human impacts on wildlife and increase species richness and diversity.

### Primary Threshold Categories Improved by Program Objectives

- |   |  |
|---|--|
|  Water Quality     |  Recreation             |
|  Air Quality       |  Fisheries and Wildlife |
|  Soil Conservation |  Noise                  |
|  Scenic Quality    |  Vegetation             |

### Program Elements

EIP partners and public stakeholders will work together to control terrestrial invasive species, and to manage existing and prevent future infestations of aquatic invasive species. The program focus will be:

- Controlling Terrestrial Invasive Species
- Managing Aquatic Invasive Species

### Adapting to Climate Change

Warming Lake waters and ambient air temperatures are presenting new challenges to managing terrestrial and aquatic invasive species. Climate may increase growth rates of species in the region, as well as increasing the number of potential invaders. For these reasons, climate change will play an important role in this program.



## CONTROLLING TERRESTRIAL INVASIVE SPECIES

### PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, Nevada Tahoe Conservation District, Private Property Owners, Tahoe Resource Conservation District, US Forest Service, US Fish & Wildlife Service

**I**nvasive weeds are a threat to Lake Tahoe's flora, fauna, and water quality. The potential for invasions is high in the Basin because of its shared state border and travel corridors, construction and road maintenance activities, and the seasonal influx of tourists. Once established, noxious and invasive weeds reduce land and recreational values, degrade water quality and wildlife habitat.

### Goal

To protect the biological diversity of the Lake Tahoe Basin from terrestrial invasive species.

Because the Lake Tahoe Basin is in the relatively early stages of infestations by noxious and invasive weeds, early detection and rapid response are essential to reduce the cost and effort of later removing established populations.

The focus of this program is to have an integrated and collaborative approach to identify, map, manage and eradicate

noxious and invasive weeds within the Lake Tahoe watershed. A diverse partnership of agencies and community members, known as the Lake Tahoe Basin Weeds Coordinating Group is instrumental in coordinating this program and implementing on-the-ground projects.

### Priority Projects

- Detection and mapping of historical and new infestations
- Control and eradication programs
- Education and outreach.



Terrestrial invasive species pose a major threat to Lake Tahoe. At left: Bull Thistle, invasive weed. At right: Toad flax.

### Accomplishments to Date

- EIP partners completed detection surveys on 1,880 miles of roads and more than 8,000 acres of public and private lands, including 3,100 acres in the Angora Fire burned area. An additional 520 sites have been monitored, including historical and new infestation sites.
- EIP partners treated 9 net acres in 2006 to eradicate invasive weeds and 21 net acres in 2007, which have substantially decreased new areas requiring treatments.
- EIP partners reached more than 5,600 people in 2008 via trainings, presentations, events, radio spots, mailings and workshops, and launched a new website in 2009.
- 380 homeowners received on-site consultations on invasive plants from local conservation districts. Additionally, EIP partners distributed 6,200 weed brochures throughout the Tahoe Basin.

### Unfunded Need for Controlling Terrestrial Invasive Species (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$1.19	\$0.75	\$0.36	n/a	n/a	\$2.3

Funding responsibility for this program is primarily assumed by federal and state entities while recognizing that opportunities for treatment on private lands will be captured and private funds reported.



## MANAGING AQUATIC INVASIVE SPECIES

### PRIMARY IMPLEMENTING AGENCIES:

Nevada Division of State Lands, Private Property Owners, Tahoe Resource Conservation District, US Forest Service, US Fish & Wildlife Service

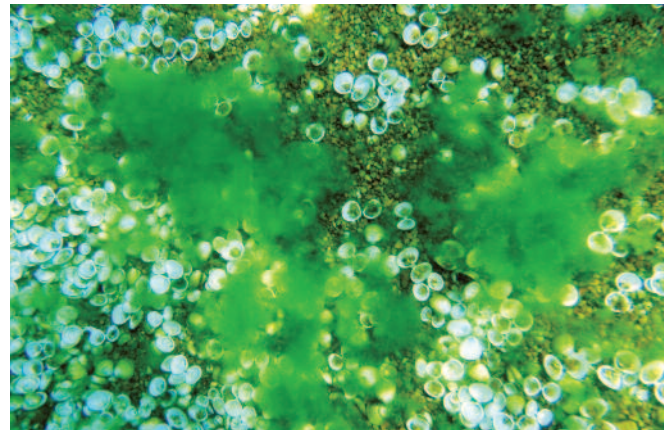
**A**quatic invasive species pose one of the most serious threats to Lake Tahoe and also to adjacent lakes Fallen Leaf, Echo, Marlette, and Cascade. Such species can be extremely detrimental to native species in addition to threatening water quality. There are currently large infestations of noxious weeds in the Lake including Eurasian water milfoil and curlyleaf pondweed. Additionally, researchers have recently discovered large concentrations of the Asian clam in multiple locations in Lake Tahoe.

Recent detections of quagga and zebra mussels in the Western United States also pose a significant threat to Lake Tahoe. These introductions could have enormous environmental and economic impacts in the Basin. Aggressive measures are in place to reduce the risk that they will be introduced into the Lake. Agencies implemented a mandatory watercraft inspection program in 2008. High risk watercraft must be decontaminated before launching into Lake Tahoe and boat ramps are closed when inspectors are not present. Additionally, outreach and education programs inform the public about what they can do to prevent invasive species introductions.

The focus of this program is preventing new introductions of aquatic invasive species and managing negative impacts from existing invasive species within the Lake Tahoe Basin.

### Priority Projects

- Keeping quagga mussels out of Lake Tahoe with an aggressive watercraft inspection and enforcement program
- Preventing new introductions of aquatic invasive species into Lake Tahoe
- Limiting the spread of existing invasive species such as the Asian clam while minimizing impacts to native species
- Abating harmful ecological, economic, social and public health impacts resulting from aquatic invasive species.



Asian clam beds like this one are a growing concern at Lake Tahoe.

### Accomplishments to Date

EIP partner agencies developed a comprehensive Lake Tahoe Region Aquatic Invasive Species Management Plan. The states of California and Nevada endorsed the plan which was then approved by the Federal Aquatic Nuisance Species Task Force.

*Goal*  
To protect the biological diversity and scenic resources of the Lake Tahoe Basin from aquatic invasive species.

A treatment program for Eurasian watermilfoil and curlyleaf pondweed is currently in place and a pilot project assessing remediation methods for Asian clams is underway.

Extensive public outreach regarding existing aquatic invasive species infestations and education on clean boating practices is ongoing.

### Unfunded Need for Managing Aquatic Invasive Species (in millions)

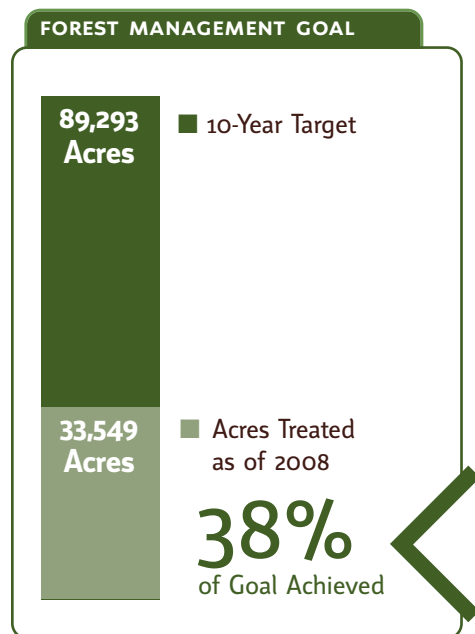
Federal	State of CA	State of NV	Local	Private	Total
\$6.31	\$3.34	\$1.08	\$1.08	\$5.94	\$17.75

All EIP partners are investing in the protection of Lake Tahoe from aquatic invasive species.



## FOREST MANAGEMENT

AFTER DECADES OF FIRE SUPPRESSION, THE TAHOE BASIN'S overstocked forests are highly vulnerable to insect, disease and catastrophic wildfire, and lack the diversity in species and age structure to support a healthy forest ecosystem. The EIP Forest Management program will improve the ecological health of Lake Tahoe's forests, reduce the buildup of forest fuels, and encourage the utilization of wood biomass.



Logging at Lake Tahoe beginning in the mid-1800s, ensuing fire suppression practices, and lack of active forest management have created overstocked forests. Overcrowding has made forests susceptible to drought stress, disease, and insect attacks, all of which have caused many of the Basin's trees to die. While low intensity wildfire is necessary for a healthy forest, the existing density and buildup of fuels can lead to catastrophic wildfires that threaten life, property, Lake clarity, scenic values, and wildlife habitat.

## HISTORY OF THE LAKE TAHOE BASIN FOREST

The forests of today are a legacy of the choices made only 150 years ago—just a small fraction of time in Lake Tahoe’s life span.

The discovery of silver in Virginia City brought early European settlers into the Tahoe Basin and touched off drastic changes to the forest. Clear cutting in parts of the Basin bared the hills, and without roots to hold the soil in place, massive erosion brought sediment rushing into the Lake. This sediment clouded the crystal clear waters and altered the fragile balance between the Lake and its surrounding ecosystem.

After exhausting timber resources, the loggers moved on and vegetation slowly returned to Tahoe’s hillsides. Unfortunately, because so many trees were cut at once, the natural regeneration and fire suppression actions that followed produced a different forest than in the pre-logging and mining era. The Tahoe Basin’s trees are two to six times denser than a healthy forest with a substantially higher proportion of white fir, and a lower proportion of fire resistant and drought tolerant Jeffrey Pine. This species mix contributes to a much heavier fuel concentration and poses a threat of catastrophic fire, which in turn increases the risk of property loss, and threatens human safety, Lake clarity, forest vegetation, and wildlife habitat.

Today, the EIP Forest Management Program focuses on forest thinning within the Wildland Urban Interface (WUI), biomass utilization where appropriate, and the implementation of the 10-Year Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy which includes community wildfire protection plans.



**1870:** Loggers begin to clear cut forests of Tahoe.



**1870-1900:** Two-thirds of the forest was cut and shipped to the Comstock Lode.



# Forest Health and Hazardous Fuels

## FOREST ECOSYSTEM HEALTH AND HAZARDOUS FUELS REDUCTION

The Forest Ecosystem Health and Hazardous Fuels Reduction program will make Lake Tahoe's forests more resilient to catastrophic wildfire and improve their ability to respond to natural disturbances. EIP partners will achieve these goals by restoring forests to more natural densities, age structure, and species composition while preserving and enhancing ecosystem values. Utilization of biomass may help reduce greenhouse gas emissions and create alternative energy in the process. EIP partners will design projects to achieve multiple environmental benefits such as reducing fuel loading while improving riparian vegetation and overall ecosystem health.

### Primary Threshold Categories Improved by Program Objectives

- |   |  |
|---|--|
|  Water Quality     |  Recreation             |
|  Air Quality       |  Fisheries and Wildlife |
|  Soil Conservation |  Noise                  |
|  Scenic Quality   |  Vegetation            |

### Program Elements

The EIP Forest Management activities are focused in the following areas:

- Advancing Forest Ecosystem Health and Reducing Hazardous Fuels
- Utilizing Biomass from Forest Fuels Reduction.

### Adapting to Climate Change

Lake Tahoe's forested landscapes offer the potential to both mitigate and adapt to the threats of climate change. The EIP Forest Management projects will be designed to:

- Increase the storage of carbon in the Tahoe Basin's forests
- Reduce the risk of catastrophic wildfires, a major source of greenhouse gas emissions
- Encourage the use of biomass to supplement pile burning of forest wood waste and to generate alternative energy
- Grow forests that are resilient to climate change
- Design habitat improvement projects to take into account the potential changes in the type, location and distribution of vegetation communities.



## ADVANCING FOREST ECOSYSTEM HEALTH AND REDUCING HAZARDOUS FUELS

### PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, California State Parks, Local Fire Districts/Agencies, Nevada Division of Forestry, Nevada Division of State Lands, Nevada Fire Safe Council, Private Property Owners, US Forest Service

Catastrophic wildfire poses a serious threat to life, property and the Lake Tahoe Basin's environment. The 10-Year Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy states that current wildland fuel conditions within the Lake Tahoe Basin could support high-intensity wildfires that are very difficult to suppress. In addition, values uniquely associated with the Tahoe Basin are also at risk. These include commercial and public infrastructure, the clarity and beauty of Lake Tahoe and its scenic landscapes, its tourism-based economy and the ecological values of its surrounding forests. Several plant communities are of special concern because of their rarity, importance to a large number of species, declining abundance, or reduced distribution. Preservation and enhancement of these plant communities (including aspen stands, late seral stage conifer forests, cushion plant communities, and fens) are central to sustain the biological integrity of the Basin's ecosystems.

The focus of this program is to manage and enhance forest ecosystem health while reducing hazardous fuels that pose a serious threat to life, property and the Lake Tahoe environment in a manner consistent with achieving environmental thresholds. The fuel treatment prescriptions for the general forest are designed to modify fire intensity and spread while reducing high density stands and insect infestation and disease in treated areas. Emphasis in these areas is on landscape-scale fire modification.

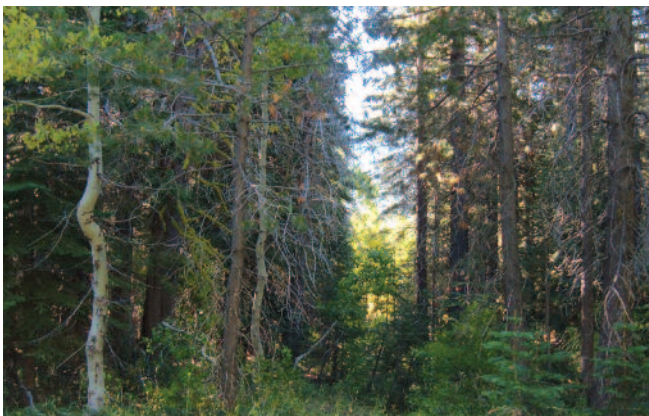
Forest areas adjacent to urban areas are the most critical areas on which to focus fuel reduction work. Fuels treatments reduce the threat to developed areas from wildland fire and reduce the potential of structure fires from spreading into the open forest.

Forest management projects will be prioritized based on the 10-Year Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy. Factors affecting prioritization include: fire regime condition class, degree of change from historical conditions, potential for further degradation if project is not initiated, compatibility with other EIP programs, cost-effectiveness, and likelihood that implementation will be successful.

*Goal*  
To protect forest ecosystem health and reduce forest fuels.

### Priority Projects

- Forest thinning and prescribed fire to reduce hazardous fuels and to enhance underrepresented species or achieve desired densities or age structures
- Enhance and preserve plant communities of special concern (including aspen stands, late seral stage conifer forests, cushion plant communities, and fens) because of their rarity, importance to a large number of species, declining abundance, or reduced distribution



Before treatment.



After initial treatment (future fuels and restoration projects will occur).

- Stream environment zone restoration and enhancement projects
- Activities intended to mimic fire or other natural disturbance regimes at the appropriate magnitude, extent, and frequency
- Appropriate use of landscape design to buffer sensitive areas
- Propagation, planting, or other techniques to increase the extent and vigor of underrepresented plant species
- Forest management projects on thousands of publicly-owned urban lots throughout the Basin.

### Accomplishments to Date

More than 96 acres of old growth forests have been protected or enhanced while approximately 240 acres of disturbed lands have been re-vegetated. Forest fuels reduction work has been completed on more than 33,549 acres, and hand crews have treated urban lots covering over 1,500 acres. Treatment methods include chipping, mastication, and burning.

The Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy was completed, and the Multi Agency Coordination Group (MAC) was established to facilitate the implementation of the strategy. The Tahoe Fire and Fuels Team completed hazardous fuels reduction activities on over 1,500 acres in 2008 and 50 projects totalling 2,000 acres in 2009.



Slaughterhouse Canyon Fuels Reduction Project before treatment.

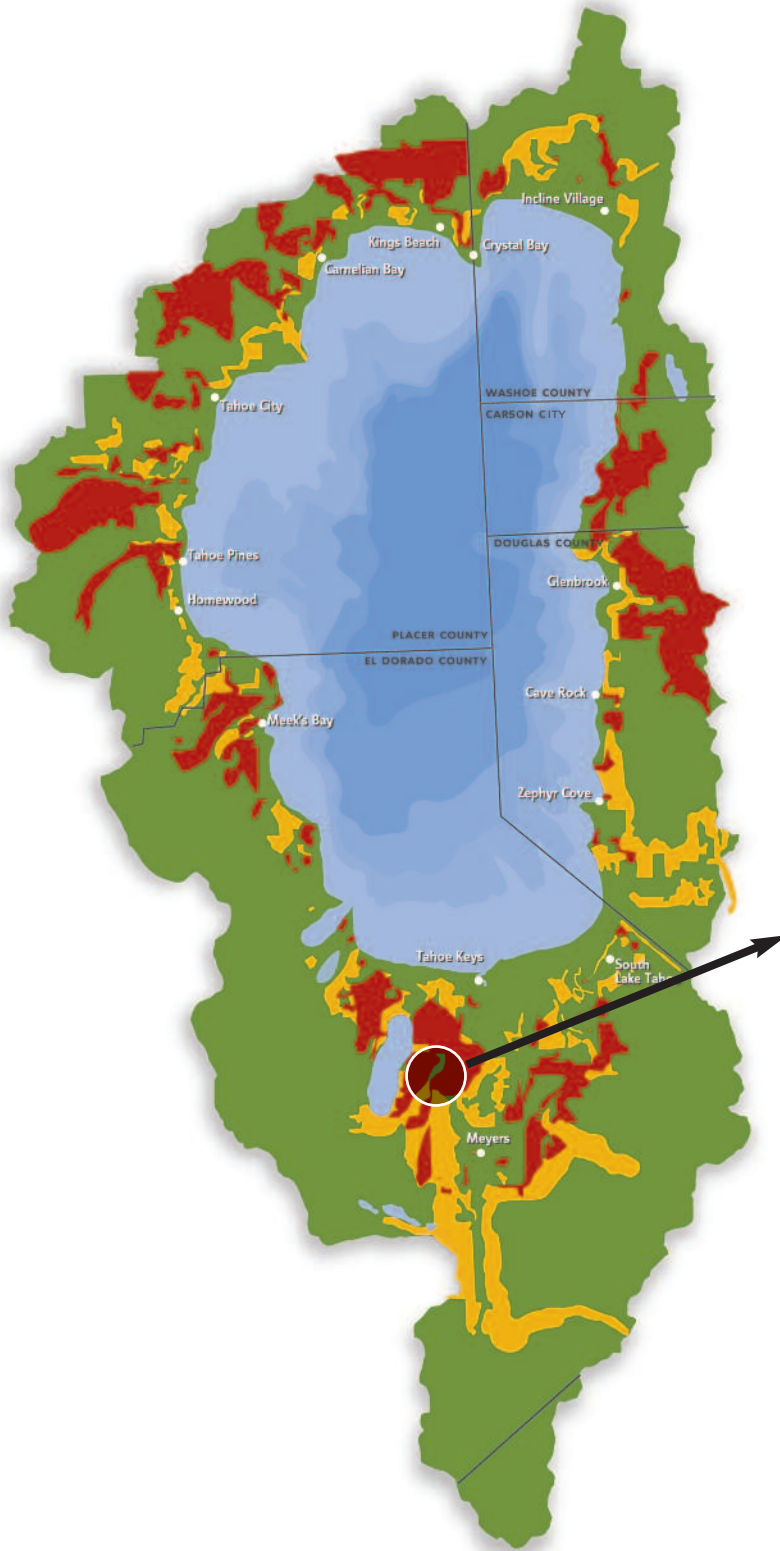


Slaughterhouse Canyon Fuels Reduction Project after treatment.

Unfunded Need for Advancing Forest Ecosystem Health and Reducing Hazardous Fuels (in millions)					
Federal	State of CA	State of NV	Local	Private	Total
\$82.14	\$31.93	\$4.36	\$16.35	\$58.86	\$193.64

The implementation of the 10-Year Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy is a high priority for all EIP funding partners.

## FUELS TREATMENTS COMPLETED AND FUTURE ACREAGE TARGETS



- 21,293 acres of fuels treated as of December 2006
- 68,000 acres planned for fuels treatments from 2008-2018

### ANGORA WILDFIRE JUNE 2007:

The devastation caused by the Angora Wildfire underscores the urgent need for fuels reduction at Lake Tahoe. An illegal campfire started the blaze which burned 3,100 acres and destroyed more than 245 homes and structures. Tahoe Basin fire organizations, land management agencies, and private property owners are implementing the Multi-Jurisdictional Fuels Reduction and Wildfire Prevention Strategy over the next 10 years which will help reduce the risk of future catastrophic wildfires. A post-fire Forest Service analysis demonstrated fuels treatments in and around the Angora burn area moderated the fire behavior. These treatments provided firefighters safer areas to fight the wildfire, and as a result, helped save many homes from destruction.



## UTILIZING BIOMASS FROM FOREST FUELS REDUCTION

### PRIMARY IMPLEMENTING AGENCIES:

California Tahoe Conservancy, Nevada Division of State Lands, Nevada Fire Safe Council, Placer County, US Forest Service

**H**azardous fuel reduction projects are designed to reduce the potential of catastrophic fire, protect valuable assets at risk and restore forest health. Forest management and thinning projects in the Tahoe Basin generate wood waste biomass that is typically chipped, masticated or left in the forest for pile and/or broadcast burning. Smoke from burning impacts air quality, contributes to an

increase in nutrient loading to Lake Tahoe, creates greenhouse gases, and generates concerns from adjacent residents. Providing some of this material to biomass facilities in or near the Basin could have several impor-

tant benefits including improvements in air quality, reduction of greenhouse gas emissions that impact public health and Lake clarity, and production of alternative energy.

Current estimates indicate that the Basin's initial treatment of forest fuels reduction projects could provide approximately 12,500 green tons of biomass annually.

This program will focus on the development of cost-effective methods for utilizing and transporting wood waste material into a viable energy source. Biomass utilization opportunities will be considered in hazardous fuels reduction and forest health projects.

### Priority Projects

- Utilizing biomass on existing treated public and private lands
- Linking forest health treatments to biomass energy production.



Chip storage facilities like this one in Douglas County are possible because of EIP partnerships.

### Accomplishments to Date

Agencies have prepared several preliminary assessments of biomass potential in and around the Lake Tahoe Basin and biomass projects are currently underway. For example, Placer County has helped local residents collect and remove biomass from private lands. Similarly the Nevada Tahoe Conservation District (NTCD) coordinated a multi-partner effort to establish a biomass transfer station on the south shore of Lake Tahoe.

The NTCD facilitated this collaborative project with the Nevada Division of Forestry, Tahoe Douglas Fire Protection District, Nevada Fire Safe Council, Douglas County Sewer Improvement District, and the Tahoe Regional Planning Agency. The transfer station serves homeowners by having a drop off point for fire defensible space project debris. Chips are transported to the Nevada biomass cogeneration plant operated by the Nevada Department of Corrections.

### Unfunded Need for Utilizing Biomass from Fuels Reduction (in millions)

Federal	State of CA	State of NV	Local	Private	Total
\$7.1	\$1	\$0.9	\$1	n/a	\$10

Funding responsibility for this program is primarily assumed by federal and state entities while recognizing that opportunities for treatment on private lands will be captured and reported.