

A Northern goshawk photographed in Washoe Valley. See story on page 13.



TAHOE IN DEPTH

Protecting, Enjoying & Exploring the Lake Tahoe Basin Winter 2018 ■ Issue #14

Crews close to finishing bike trail from Incline Village to Sand Harbor

By Jeff DeLong
SPECIAL TO TAHOE IN DEPTH

Along a stunning stretch of shoreline at North Lake Tahoe, a vision for the future is quickly taking shape.

Crews are nearing completion of a 3-mile-long bicycle and pedestrian trail linking Incline Village to Sand Harbor State Park.

This project isn't just a bike trail, it includes significant water-quality improvements and off-highway parking and is part of a broader "Stateline to Stateline" strategy to establish shared-use trails all along Lake Tahoe's Nevada side from the Stateline casino area on the South Shore to Crystal Bay on the North Shore. Ultimately, officials hope to build bicycle-pedestrian trails ringing all of Lake Tahoe, with much of the work on the California side already complete.

Reducing reliance on motor vehicles

Continued on page 23

Brown, Sandoval will be missed



Photo: Courtesy of Nevada Department of Transportation
Gov. Brian Sandoval of Nevada heads out on a test ride on a new bike path at Lake Tahoe.

Governors played pivotal roles in Tahoe restoration over last 8 years

By Tom Lotshaw
TAHOE REGIONAL PLANNING AGENCY

This January marks the end of an era for Lake Tahoe, with the departure of California Gov. Jerry Brown and Nevada Gov. Brian Sandoval because of term limits. Governors of the states since 2011, Brown and Sandoval and their administrations have been instrumental in the bi-state collaboration and progress at Lake Tahoe over the past decade.

"The Tahoe Basin and everyone who cherishes Lake Tahoe should applaud

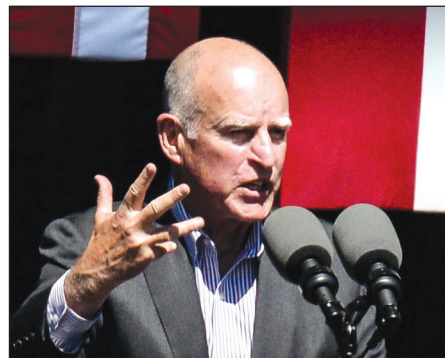


Photo: Tom Lotshaw
Gov. Jerry Brown delivers a speech at Tahoe.

Governors Brown and Sandoval for eight years of dedication and support for this important natural resource," said Joanne S. Marchetta, executive director of TRPA. "Thanks to their leadership, and their administrations, partners at Tahoe are collaborating and working together better than ever, and Lake Tahoe's environment and communities stand to benefit the most."

California and Nevada were major

Continued on page 4

PRRST STD
U.S. POSTAGE
PAID
RENO, NV
PERMIT #765

Tahoe In Depth
PO Box 5310
Stateline, NV 89449

INSIDE THIS ISSUE:

- **CLARITY:** For 50 years, researchers have measured Tahoe's clarity **3**
- **CLIMATE:** Fourth California assessment measures impact of warming planet **5**
- **SHORELINE:** New plan is a 'landmark achievement' for Tahoe **6**
- **ASPENS:** Forest Service working to restore at-risk stands of trees **8**
- **SUMMIT:** Feinstein praises the work of 'Team Tahoe' **9**
- **UPPER TRUCKEE:** Meadow acquisition a milestone in restoration work **11**
- **THE KEYS:** Zephyr Collaboration facilitating weed-control initiative **12**
- **BIRDS:** Research team keeping eye on rare goshawks, owls **13**



A reminder of the challenges we're facing

Snow is on the ground at Lake Tahoe again and the scene is magical. As we move into this season of thanks and giving, the stark reminder of how precarious it all is rings true. Just a few hours from Lake Tahoe, the Camp Fire devastated an entire community and is California's deadliest wildfire. Our hearts go out to our neighbors. The fires in the wine country and Santa Rosa are still fresh in our



minds from last year as well. Lake Tahoe's Angora Wildfire in 2007 put fire danger squarely on our collective radar screens in the Tahoe Basin, and the landscape is still scarred. The loss of life and utter destruction from the Camp Fire underscores the need for accelerated forest thinning treatments and forest ecosystem restoration. And Tahoe is on top of it. See page 7 for the latest work in this area and for how to support the victims of the Camp Fire.

Our cover story salutes the transition of California and Nevada's gubernatorial administrations as Govs. Sandoval and Brown conclude their terms. Both states were committed to Lake Tahoe's protection over the last eight years during a time of unparalleled threats from climate change, invasive species, and wildfire. The Tahoe Basin owes a debt of gratitude for their leadership and commitment to bi-state collaboration in support of Tahoe's environment, economy, and communities.

Despite the challenges we face, amazing work is underway to make Lake Tahoe a better place. We hope you'll enjoy reading about some new trails, projects, and scientific research that will make Lake Tahoe more resilient to emerging threats in the future. Happy Holidays and thanks for supporting Tahoe In Depth!

— Julie Regan
executive editor

Tahoe In Depth

Publisher and contributors: The Tahoe Regional Planning Agency publishes Tahoe In Depth in partnership with various state and federal agencies. Contributors include the California Tahoe Conservancy, U.S. EPA, U.S. Fish & Wildlife Service, U.S. Forest Service, Incline Village General Improvement District, Lahontan Regional Water Quality Control Board, League to Save Lake Tahoe, Nevada Department of Wildlife, Nevada Division of Environmental Protection, Nevada Division of State Lands, Nevada Division of State Parks, Tahoe City Public Utility District, South Tahoe Refuse, Tahoe Fund, Tahoe Resource Conservation District, Tahoe Transportation District, Tahoe Water Suppliers Association, University of California, Davis, University of Nevada, Reno, Desert Research Institute, and the Washoe Tribe.

Executive Editor: Julie Regan

Managing Editor: Sarah Underhill

Design/Copy Editor: Jim Sloan

Contributors: David Antonucci, Morgan Beryl, Chris Carney, Stephanie Coppeto, Jeff DeLong, Heidi Hill Drum, Shana Gross, Jay Howard, Adam Jensen, Tom Lotshaw, Devin Middlebrook, Kae Reed.

Copyright 2018 © — All rights reserved.

Major funding provided by:



TAHOE
REGIONAL
PLANNING
AGENCY



CONTENTS

14

Best in Basin

Read about the best redevelopment and restoration work completed in the Tahoe Basin in the past year. Featured work includes a new brew pub and photo studio as well as a project that reduces stormwater pollution and restores a meadow.



Photo: Tom Lotshaw

16

Tahoe heritage

A craftsman on the North Shore has constructed a replica of a Washoe tribe cedar-bark winter hut at the Incline Village Visitor Center. It will be the starting point for short hikes that will help visitors learn more about Tahoe's indigenous people.



Photo: Penelope Curtis

17



Photo: Tahoe Rim Trail Association

Desolation renovations

With the help of the Tahoe Fund, volunteers this summer launched a multi-year project to rehabilitate areas on the northern boundary of the 63,960-acre Desolation Wilderness west of Lake Tahoe.

18

Rejuvenated meadows

The U.S. Forest Service is restoring six of the Tahoe Basin's iconic meadows to enhance the area's natural ability to filter the runoff headed for Lake Tahoe.

20

Fanny Bridge

Tahoe City's Fanny Bridge, the site of one of the lake's most troublesome traffic chokepoints, will benefit from a \$35 million project to help cars and people move more smoothly through the area.



Photo: Drone Promotions

28



Photo: Tahoe Area Mountain Biking Association

Working for trails

Some 150 volunteers worked more than 2,000 hours building new trails along Angora Ridge through an area burned by the Angora Fire in 2007. The new trails offer stunning views of Fallen Leaf Lake and Mount Tallac.

50 years of measuring Tahoe clarity

Research data provide historic record of changes in the quality of lake's transparency

By Jeff DeLong

SPECIAL TO TAHOE IN-DEPTH

Once every week or two, scientists take to the waters of Lake Tahoe, motoring far from shore in a mission to gauge the status of the lake's famed clarity.

Bobbing atop those azure waters, the UC Davis research vessel John Le Conte comes to a stop and equipment is carefully readied. A white, dinnerplate-like device called a Secchi disk is slowly lowered below the surface, sinking into Tahoe's depths until it fades from view. Measurements are recorded to provide a snapshot of lake clarity, with those findings driving many important restoration efforts designed to protect a national treasure.

These regular clarity measurements, which first documented an alarming problem but later offered hope that things are improving, continue today 50 years after they first began. The method is largely unchanged, but is no less important decades later as altering conditions point to new challenges.

"It's been of tremendous importance. If we didn't have that record now, we'd still be arguing over whether the clarity has ever changed," says Geoffrey Schladow, director of UC Davis' Lake Tahoe Environmental Research Center.

"Now we have a record," Schladow says. "We're not arguing if it's changed. We're arguing about what we can do to bring it back."

Charles Goldman had the problem on his radar screen even longer than 50 years ago. In a rowboat, beginning in 1959, the young scientist started measuring what he considered a threat to Lake Tahoe that had already irreversibly altered conditions at lakes in the East and Midwest.

The danger, Goldman feared, was posed by free-floating algae, which turns lakes from blue to green.

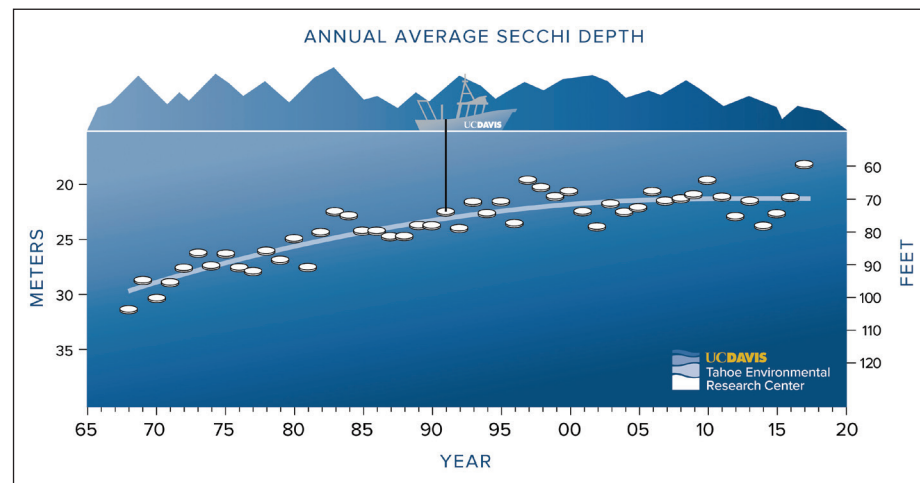
"Nobody seemed to realize how much danger Tahoe was in," Goldman recalls. "Tahoe was in real danger of becoming green."

Lake Tahoe is considered one of the most important water bodies in the country. The U.S. Environmental Protection Agency has identified it as a priority watershed, not only because of its iconic beauty and crystal-clear waters but because of the human-related impacts



Photo: UC Davis

A researcher from UC Davis prepares to lower a Secchi disk and measure the clarity of Lake Tahoe.



that threaten those very qualities.

Back when Goldman first raised the alarm, Tahoe was ringed by residential communities using septic tanks, which could leak nutrients into the lake to fuel algae growth. There was also a push to employ tertiary wastewater treatment plants to treat sewage, with many experts arguing that treated effluent could then be discharged safely into Tahoe's waters.

Goldman believed such a move would add massive amounts of nitrogen into the lake and trigger disastrous results. In an experiment, he added mid-lake water to tertiary-treated effluent and watched as the mixture turned green in a few days.

Goldman's work led to the removal of septic tanks and new laws requiring treated effluent be piped outside the

Tahoe Basin.

"It would have been a disaster to put that wastewater effluent into the lake," Goldman said. "Overall, that's the most important thing I ever did for Lake Tahoe."

Goldman's early measurements at Tahoe were funded by a grant primarily directed toward similar work at Castle Lake near Mount Shasta. In 1968, UC Davis received federal funding that allowed it to commence regular clarity measurements of Lake Tahoe using the Secchi disk, which continue today 50 years later.

"This is one thing that hasn't changed," Schladow said. "It sounds very simplistic but we have a very rigid protocol that we follow."

"Because of Dr. Goldman, Lake Tahoe boasts one of the world's longest-running data sets," said University of Nevada, Reno's Sudeep Chandra, who studied with Goldman decades ago.

Researchers determine clarity by watching the white disc descend into Tahoe's depths until it disappears.

"It's telling us how much light is getting down from the sun, how far it's penetrating into the lake," Schladow said. Those taking the measurements are required to have perfect vision. If necessary, corrective glasses or contact lenses can be used, but they can't be polarized as that would throw off the readings.

The Secchi measurements, taken every week or two for an average of 25 per year, demonstrated a worrying trend—Tahoe's average mid-lake clarity was steadily diminishing over the years.

"Clarity was going down. There was a long-term decline and basically each year was getting worse and worse," said Dan Segal, principal natural resource analyst for the Tahoe Regional Planning Agency.

Free-floating algae was part of the problem but scientists would determine another factor was even more important. Fine particles of sediment were washing into the lake from Tahoe's roads and urban centers, scattering light and impacting clarity.

More than \$2 billion have been spent since 1997 to achieve key environmental improvements around the lake, with controlling the flushing of fine sediments and introduction of algal nutrients into Tahoe's waters always a central goal.

At Kings Beach on the North Shore, a major project to alter the heart of town into a more environmentally friendly and walkable community was recently completed. Traffic roundabouts, sidewalks and scenic improvements may be the most visible change there, but installation of stormwater treatments to result in a "substantial alteration in quality of surface runoff" was also a high priority. Such is the case with any major road project or development that now occurs within the Tahoe Basin.

Across the lake, big plans are in place to restore the South Shore's Upper Truckee River marsh—one of the most

Continued on page 4

UC Davis: Unprecedented weather in 2017 hurts lake clarity

Historic drought followed by record-breaking precipitation and warm lake temperatures converged in 2017 to produce the lowest annual average clarity levels recorded at Lake Tahoe, according to the Tahoe Environmental Research Center at the University of California, Davis.

The average annual clarity level for 2017 was 59.7 feet. This was a 9.5-foot decrease from the previous year, surpassing the previous lowest value of 64.1 feet in 1997. Mid-lake clarity levels can swing widely from season to season and year to year, and the five-year average lake clarity is approximately 70 feet.

"In 2017, Lake Tahoe's low clarity was primarily the result of two extreme climatic and hydrologic events," said TERC Director Geoffrey Schladow, a professor of engineering at UC Davis. "The combination of arguably the most extreme drought period ending with the most extreme precipitation year produced the low clarity values. Measurements for 2018 have already shown a large improvement."

Clarity is typically at its worst in the summer, and tends to improve during the fall and winter. In 2017, that pattern diverged with the worst clarity extending through the fall. Clarity values through mid-March were better than in many recent years. However, they failed to improve during fall and winter. For more information, visit: tahoe.ucdavis.edu.

By 2000, scientists found the steady decline in clarity had been arrested

Continued from page 3

disturbed places in the Tahoe Basin – so it can once again act as a natural filter for Tahoe's waters and help reduce the scale of contaminants flowing into the lake to threaten its clarity.

The investments appear to have paid off. Beginning in 2000, scientists reported that the steady decline of Tahoe's clarity appeared to have been arrested. While annual clarity varies year to year based on a number of factors including precipitation, average clarity now hovers around a depth of about 71 feet.

"We have taken corrective action and it's showing benefits," Schladow says.

If the long-term trend is encouraging, there are still bumps in the road. In 2017, Tahoe's average clarity was only 59.7 feet, the lowest reading ever recorded over the last 50 years. Scientists attribute low clarity last year to a record wet winter in 2016-17 that washed sediments that accumulated during the previous five years of drought into the lake at once. Readings taken in early 2018 showed a clarity of about 73 feet, indicating clarity is now rebounding and the overall trend of improvement is still on track.

Scientists and land managers are working to restore Tahoe's clarity to historic levels similar to what existed 50 years ago, when one could see more than 100 feet into Tahoe's depths.

That's the goal of California and Nevada's Total Maximum Daily Load Program, which seeks to reduce the

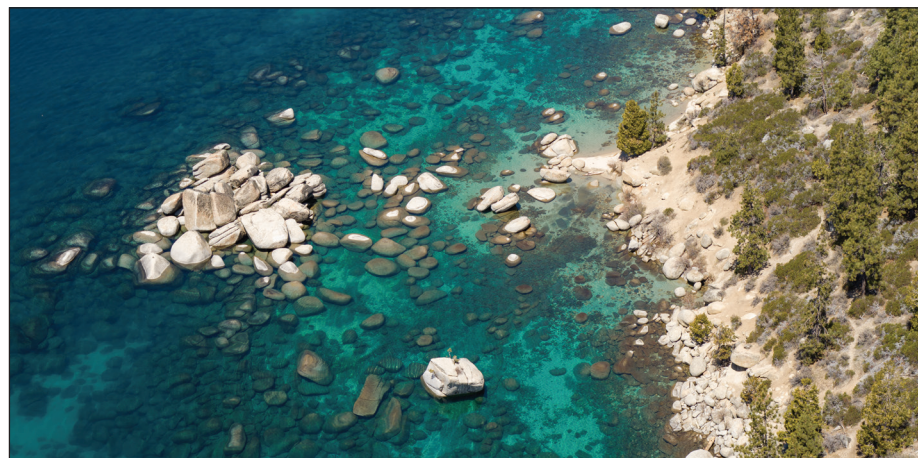


Photo: Drone Promotions

Scientists and land managers are working to restore Tahoe's clarity to historic levels similar to what existed 50 years ago.

amount of fine sediment particles entering the lake by 65 percent and reduce the amount of algal nutrients nitrogen and phosphorus by 10 percent and 35 percent respectively.

A near-term goal, the Lake Tahoe Clarity Challenge, seeks to increase clarity to 78 feet by 2026 and to maintain that average level for five years after that. Do these goals remain realistic?

"I'm cautiously optimistic," said TRPA's Segán. "But we recognize it's a real challenge."

One worry is that while winter clarity measurements are improving, significant declines in the summer are occurring.

And the big unknown is the impact of a warming climate, which could alter lake chemistry and encourage algae growth in

a warmer Lake Tahoe.

"Climate change seems to be affecting clarity in a number of ways," Schladow said. "What the solution to that might be is what we're working on now."

Many great minds are at work. The University of Nevada, Reno's Global Water Center supports science that advances sustainability of water bodies around the world.

"I'm also optimistic about Tahoe's future," said Chandra. "Compared to all the lakes globally where we work, Tahoe's collaborative approach to restoration is integral to solving the pressing problems like climate change."

Jeff DeLong is a freelance writer.

Brown, Sandoval

Continued from page 1

partners with TRPA in creating and adopting the 2012 Regional Plan, approved on Dec. 12, 2012. The landmark plan update ushered in a new era of public, private, and bi-state collaboration, creating a broadly-supported framework for greater private investment and redevelopment that is furthering the conservation and restoration of Lake Tahoe's environment and the revitalization of its communities.

The results of this collaboration speak for themselves: The private sector has invested more than \$600 million at Lake Tahoe since 2012.

California and Nevada have been leading partners in the Lake Tahoe Environmental Improvement Program (EIP) as well. Managed by TRPA with more than 50 local, state, federal, and private sector partners, EIP projects

“Governor Sandoval’s leadership has been instrumental in establishing a new era of collaboration to protect Lake Tahoe. Nevada is more committed than ever to preserving Tahoe’s unique natural beauty and economy for current and future generations of Nevadans and the millions who visit the lake every year.”

Bradley Crowell

Director, Nevada Department of Conservation and Natural Resources

conserve and restore Tahoe's environment and clarity while enhancing outdoor recreation opportunities.

Both states have been steadfast in their commitments to the EIP. For example, two major projects will leave an indelible mark on the lake: The 3-mile Incline Village to Sand Harbor shared-use path in Nevada and restoration of the Upper Truckee Marsh in California. These projects, along with myriad other restoration initiatives around the basin, are improving the lake's fragile environment and contributing to the economic revitalization of the region.

Over the last five years, California and Nevada have also committed annual funding to help protect the lake from aquatic invasive species through the watercraft inspection program that has successfully prevented any new invasive species introductions over the last 10 years.

"Both governors are leaving a positive legacy of collaboration at Lake Tahoe for

the benefit of future generations," said Darcie Goodman Collins, PhD, chief executive officer of the League to Save Lake Tahoe.

Tom Lotshaw is public information officer for the Tahoe Regional Planning Agency.

“The work accomplished over the past eight years helped Lake Tahoe thrive environmentally and economically. These bipartisan efforts to restore Tahoe must continue into the next administration.”

John Laird

California's Secretary for Natural Resources.

New report outlines likely climate change impact

Tahoe and Sierra already seeing effect of warming temperatures in water, wildfire risk

By Devin Middlebrook

TAHOE REGIONAL PLANNING AGENCY

California is a global leader in climate change through reducing greenhouse gas emissions and proactively addressing the changes the state is already experiencing. Guiding this work is a body of scientific understanding of climate and its projected impacts across California. The state's Fourth Climate Change Assessment updates and summarizes known climate science and identifies its impacts at a regional level.

The fourth assessment consists of 33 research projects that look at climate impacts on a regional level across the state. The information addresses gaps in current climate knowledge and serves as the basis for implementing action-oriented projects at a local level. New to the fourth assessment is scaled down regional data that show the impact on infrastructure, people, and environment across the state.

Lake Tahoe and the Sierra Nevada Region are already seeing the impacts of climate change, including increased wildfire risk, rising air and water temperatures, reduced snowpack, and changes to water availability. According to the fourth climate assessment, "by the end of the 21st century, temperatures in the Sierra Nevada are projected to warm by 6 to 9 degrees Fahrenheit." The greatest impact of these changes will be to local communities that are dependent on natural resources for economic, cultural, and social prosperity. This warming will also have a dramatic impact on the fresh water supply for the entire state.

Snowpack and runoff

According to the fourth assessment, by the year 2100, average snowpack in the Sierra Nevada will be reduced by up to 60 percent. Further, snowpack below 6,000 feet will be eradicated. The loss of snowpack will lead to drier soils, loss of vegetation, changes to rivers and lakes, and a decrease in water supply. Lake Tahoe's surface elevation of 6,225 feet sits within the snow-to-rain zone.

Not only will rising temperatures lead to decreases in snowpack, but they will shift the pattern of runoff, the main source of water in the state. Historically, peak runoff occurs between June and July, but projected peak runoff is expected to shift to between March and April. This



Photo: Chris Mertens

According to the latest findings, the average snowpack in the Sierra will be reduced to 60 percent by 2100 and the area burned by fire is expected to increase between 70 percent and 241 percent.

To learn more about the role you can play, visit
www.laketahoesustainablecommunitiesprogram.org

has implications for water storage and stormwater treatment, which is critical to preserving Tahoe's clarity.

Wildfire

The starkest impact of the most recent drought in California is the 129 million dead trees in the Sierra Nevada. This massive death of vegetation has resulted in increased wildfire risk and the probability of severe wildfires. Depending on the region and climate conditions, the area burned by wildfires is expected to increase between 70 percent and 241 percent over baseline rates between 1961 and 1990. Impacts of wildfires and smoke from around the state are already evident in the Tahoe Basin.

Communities

The biggest impact of these projected changes will be to the communities across the state, and in the Tahoe Region. Outdoor recreation is the primary driver of the Tahoe Basin's \$5.1 billion economy. Climate change is directly affecting the natural resources that are the foundation of this economy. Wildfires, loss of snowpack, extended drought, and

extreme weather all threaten the health of Tahoe's economy and local communities.

Action

While the future of our climate may look bleak, local agencies and businesses are working to address future impacts today. Created in 2013, the Lake Tahoe Sustainable Communities Program is the Region's climate action plan that outlines concrete ways to reduce our contribution to climate change and prepare for the projected changes to our environment. The goal is to bring climate resiliency to the environment, communities, and economy. Some of the more successful actions related to this plan include the development of electric vehicle charging stations, adoption of a 100 percent renewable energy pledge by the City of South Lake Tahoe, continued investment in bike paths and transit, investment in forest health, and expansion of summer activities at Heavenly Mountain Resort.

Collective action by the entire community is needed to be ready for the future under climate change.

Devin Middlebrook is the Sustainability Program coordinator for TRPA.

Adapting to Climate Change at Lake Tahoe

California's Fourth Climate Change Assessment reports that Sierra Nevada communities should prepare for more severe wildfires, longer and more frequent droughts, increased flooding, and more extreme weather events.

The California Tahoe Conservancy, the Tahoe Transportation District, and their partners are assessing how well Tahoe has prepared for these increased risks. Together, the group is developing an interagency Climate Adaptation Action Plan for the Lake Tahoe Basin.

A world-class team of experts is contributing: Sudeep Chandra, University of Nevada, Reno; Michael Dettinger, U.S. Geological Survey; Alan Heyvaert, Desert Research Institute; Patricia Maloney and Geoff Schladow, UC. Davis Tahoe Environmental Research Center; and Patricia N. Manley and Peter Stine, Pacific Southwest Research Station of the U.S. Forest Service.

The collaborative team will assess how the basin's natural resources, transportation networks, communications systems, and economy are vulnerable to climate change impacts.

"Tahoe has a long history of adapting lifestyles and land management to meet environmental objectives," said Michael Dettinger, who also served as the lead coordinating author for the Fourth Climate Change Assessment's Sierra Nevada Regional Report. "I am optimistic that new adaptation efforts in the basin, like the Climate Adaptation Action Plan, will be models that regions around the state and across the nation will emulate in due time."

Moving ahead, the team will review Tahoe's existing climate plans and programs for gaps. Partnering agencies will inform the final Climate Adaptation Action Plan through their commitments to specific actions.

Preparation is only part of the work that Tahoe communities need to undertake.

An Adaptation Planning Grant from the California Department of Transportation provides a significant share of the funding for this work.

To learn how you can get involved, contact Whitney Brennan, senior environmental scientist with the Conservancy at (530) 543-6054.

Shoreline Plan: By the numbers

Shoreline structures: The Shoreline Plan authorizes up to:

- 128 new private piers, with 12 pier applications accepted every two years. Piers that serve multiple properties will be prioritized, with no more than 25 pier permits available for piers that serve a single property.
- 10 new public piers
- 2 new public boat ramps
- 1,486 new moorings, including buoys and boat lifts, with no more than 15 percent of the moorings permitted in any given year. In 2019, TRPA will ensure that all existing moorings on the lake are permitted and registered and will begin processing new mooring applications by 2020.
- Up to 330 of the new moorings will serve existing marinas, and up to 300 new moorings will serve public agencies with lakefront facilities.

Shoreline fees:

- \$43 annual mooring registration fee charged for all boat moorings. Pays for enforcement of illegal moorings, no-wake zone education and enforcement, and aquatic invasive species monitoring and control.
- \$47 annual buoy scenic mitigation fee charged for all buoys. Pays for projects to offset the scenic impacts of buoys.
- \$12 increase to annual boat sticker fees for all boat inspections. Pays for aquatic invasive species monitoring and control and watercraft inspection costs.
- \$75 annual boat rental concession fee charged for all rental boats with a 3-star or higher rating by the California Air Resources Board and \$150 annual boat rental concession fee charged for all rental boats with a lower or no CARB rating. Pays for aquatic invasive species monitoring and control and no-wake zone education and enforcement.

TRPA approves new Shoreline Plan

Recreation and safety enhanced while shoreline environment protected

By Tom Lotshaw

TAHOE REGIONAL PLANNING AGENCY

The Tahoe Regional Planning Agency Governing Board unanimously adopted a new Shoreline Plan for Lake Tahoe in October following three years of collaboration by the agency and a broad range of partners to develop the plan.

"This plan's adoption is a landmark achievement for Tahoe," said Joanne Marchetta, TRPA executive director. "Through this collaborative process, we have reached a plan that is fair and will benefit lake recreation and the environment at Tahoe."

The Shoreline Plan marks a milestone in TRPA's decades-long work to update shorezone regulations and lift a longstanding moratorium on new piers and buoys at the lake. The moratorium was based on outdated science on impacts to fish habitat.

Developed through a highly collaborative, mediated process, the Shoreline Plan aims to improve recreation access and safety on the lake while protecting the environment along the shoreline.

Many partners helped develop the plan, including TRPA, Lake Tahoe Marina Association, Tahoe Lakefront Owners' Association, League to Save Lake Tahoe, Lahontan Regional Water Quality Control Board, Nevada Division of State Lands, and California State Lands Commission. The California Attorney General's office also provided critical input.

The plan sets development caps and regulations for new shoreline structures such as piers, buoys, and public boat ramps. It also creates a framework for marinas to expand or reconfigure if they incorporate environmental improvements into the project.

"We hope the incentives included in this plan will provide excellent opportunities to improve recreational access and environmental protection for generations to come," said Jan Brisco, executive director of the Tahoe Lakefront Owners' Association.

The Shoreline Plan—which takes effect January 2019—creates programs needed to ensure shoreline structures and boating activity do not harm the environment, scenery, or recreation



Photo: Tom Lotshaw

The new Shoreline Plan expands the 600-foot no-wake zone at Lake Tahoe to include all Emerald Bay and targets better education and enforcement to help ensure a safe and enjoyable recreation experience for paddlers.

experiences at Lake Tahoe.

The cost of these programs will be paid for through new shoreline fees that TRPA and its partners worked to fairly apportion to various shoreline users and structures. These include mooring fees, an increase in boat sticker fees, and boat rental concession fees that will also take effect leading up to the 2019 boating season.

New programs will include boater education and enforcement of the 600-foot no-wake zone at Lake Tahoe, expansion of the no-wake zone to include all Emerald Bay, and no-wake zone buffers around all swimmers, paddlers, and shoreline structures to prevent unsafe boating near the shoreline where motor boats, paddlers, and swimmers interact.

TRPA is partnering with the Lake Tahoe Water Trail and the basin-wide Take Care campaign, as well as with the League to Save Lake Tahoe, marinas, concessionaires, and law enforcement agencies to implement these new boater education and enforcement activities.

In addition to strengthening its own presence on the lake with a second watercraft team, TRPA is entering an agreement with all law enforcement agencies on the lake. The goal is to coordinate and prioritize enforcement strategies through a Watercraft Task Force that will meet regularly to focus on improving compliance with boating

regulations at Lake Tahoe.

"Lake Tahoe was suffering from the lack of a shoreline plan as illegal activity caused environmental degradation and conflicts amongst recreationists on the water," said Darcie Goodman Collins, Ph.D., chief executive officer of the League to Save Lake Tahoe.

"This new plan has stronger protections, more effective enforcement, and a vastly improved education program enhanced by technology that will make everyone's experience on the lake better."

Other new programs provide coordinated TRPA enforcement against illegal boat moorings on the lake with the California State Lands Commission and Nevada Division of State Lands; more monitoring and control projects to prevent the spread of harmful aquatic invasive species; enhanced TRPA monitoring for noise and scenic impacts from boating activity and shoreline structures; and new provisions to keep noisy boats with aftermarket exhaust systems that exceed TRPA, California, and Nevada sound limits from operating on the lake.

Visit trpa.org/programs/shorezone to learn more about the plan, implementation, new permitting processes, fees, and to sign up for email news about upcoming actions.

Tom Lotshaw is public information officer at the Tahoe Regional Planning Agency.

Forest health target of expanded treatment

Wildfire risk, warming climate underscore need for faster thinning

By Jeff DeLong

SPECIAL TO TAHOE IN DEPTH

Land managers are working to significantly expand the amount of Lake Tahoe's overstocked forests treated through thinning, controlled burning, and other measures, at the same time pursuing innovative solutions to get the work done.

And a sea change of sorts is underway when it comes to charting a course for healthy forests of the future, in part due to the recognition that a warming climate, more frequent and hotter droughts, and larger wildfires are likely to change everything.

In the backdrop looms an undeniable danger: No matter how quickly progress is made, a major wildfire could strike any day with the potential to cause widespread damage to Tahoe's sensitive environment.

"Tahoe's forests are at risk. They are very, very much at risk," said Christina Restaino, forest ecosystem health program manager for the Tahoe Regional Planning Agency.

The problem dates back to the mid-1800s, when much of Tahoe's forests were clear-cut to provide timber used in Comstock gold and silver mines. The forest that grew back was largely composed of even-aged white fir trees, which are highly susceptible to drought and assault by insects.

Fire, which plays a key role in a healthy forest ecosystem, was excluded from the landscape, with most fires that did start quickly pounced upon by firefighters and extinguished. The end result was an unhealthy, over-thick forest ready to explode into flame.

Improving forest health is a key goal outlined in the Environmental Improvement Program, a long-term strategy designed to preserve and protect all aspects of Tahoe's fragile environment. The EIP identifies dozens of forestry projects needed across the Tahoe Basin. One of the largest, the 10,000-acre-plus, \$26 million South Shore Hazardous Fuels Reduction and Ecosystem Restoration Project, is nearly complete. However, constant maintenance and thinning is needed to keep forests healthy.

Since forest health was identified as a top priority during the first Lake Tahoe Summit hosted by then-President Bill



Photo: Drone Promotions

Improving forest health along the West Shore is a key goal of the Environmental Improvement Program.

Clinton in 1997, a significant amount of work has been accomplished. More than 74,000 acres of forest has been thinned to reduce the threat of fire, most of it in the wildland urban interface where the forest meets neighborhoods. Another 50,000 acres along the interface is targeted for treatment over the next decade.

While progress is occurring, it isn't happening quickly enough.

"We have to do more. That's just the bottom line," said Brian Garrett, urban forest program manager for the U.S. Forest Service's Lake Tahoe Basin Management Unit.

"The amount of work we're doing on any given forest is just not enough, including at Tahoe," Garrett said. "There's a huge discrepancy, and if something doesn't change, we're never going to get close."

For that reason, the Forest Service has embarked on a mission to increase the pace and scale of forest health projects at Tahoe and elsewhere.

To do so, the Forest Service is looking to team with both public and private partners. One proposal would employ the congressionally authorized Good Neighbor Authority, which would provide federal money to allow states to

conduct forestry work on national forest land in places where it makes sense, Garrett said. That would allow the Forest Service to focus attention elsewhere at the same time.

"It allows states to actually go out and do a project start to finish for us," Garrett said. The Forest Service is also teaming with a national nonprofit group, the National Forest Foundation, to obtain \$20 million — \$10 million in federal money and \$10 million in private grants — to fund forest health projects within a "treasured landscape" extending across west Tahoe, the Truckee area, and into the American and Yuba river drainages.

The Forest Service also hopes to increase efficiency of environmental analyses for forest health projects required under the National Environmental Policy Act. Use of categorical exclusions could still allow for adequate environmental review of certain projects but speed up a process now often encumbered and delayed.

Combined, proposed changes could significantly move toward addressing the deficit in needed work in the forest, Garrett said.

"We're looking at getting more work on the ground at the pace and scale that's

Camp Fire: How to donate

The American West continues to face more devastating wildfires.

The Camp Fire that ignited on Nov. 8 in Butte County, California, quickly became the deadliest fire in the state's history. The Camp Fire killed 88 people, injured three firefighters, and burned 13,972 homes, 528 commercial buildings, and 153,336 acres, according to Cal Fire.

Numerous nonprofit organizations are working to help the many people affected and displaced by the Camp Fire. Please consider donating to help:

- American Red Cross: www.redcross.org
- California Community Foundation Wildfire Relief Fund: www.calfund.org
- California Fire Foundation: www.cafirefoundation.org
- United Way of Northern California: www.norcalunitedway.org/camp-fire

appropriate for Lake Tahoe," Garrett said.

Another change in direction in forest health practices is exemplified by the Lake Tahoe West Restoration Partnership,

Continued on page 23

Forest Service restores disappearing aspen stands

Lack of low-intensity fire and other regular disturbances contributing to aspen loss

By Stephanie Coppeto
U.S. FOREST SERVICE

Quaking aspen is a native tree species with a variety of remarkable qualities. Aspen is the most widespread native tree species in North America and is believed to be the second most widespread tree in the world after the Eurasian aspen. At over 100 acres in size, an aspen clonal colony in Utah (Pando) has been described as the single most massive living organism known on Earth.

Aspen commonly reproduce by suckering, sending up roots from a parent root system. Aspen are also so good at photosynthesis (making plant food from sun, water, and carbon dioxide) that even their bark can photosynthesize. That's why sometimes the bark of aspen appears to be green. Young aspen can grow up to 15 feet in their first five years.

In 2000, the Lake Tahoe Watershed Assessment identified aspen stands as "ecologically significant areas" because of their value and relative scarcity on the landscape. Aspen comprise 2 percent of the land managed by the U.S. Forest Service Lake Tahoe Basin Management Unit (LTBMU), yet they support many wildlife, plants, fungi, and soil processes.

Restoration of Tahoe aspen

Aspen are facing challenges throughout the American West. At Lake Tahoe, aspen stands are being converted to conifer forests because naturally occurring fires and other disturbances haven't kept conifer growth in check.

"Historically, fires would have thinned out some of the growing conifer trees in aspen stands and helped stimulate aspen reproduction," said LTBMU Assistant Fire Management Officer Kyle Jacobson. "Without disturbances like fire, conifers compete with aspen for light, space, and nutrients."

"Conifer trees are a natural component of aspen stands but not in great numbers like they are now. It appears as if aspen and conifer trees have coexisted for centuries, but now without frequent fires, conifers have been taking over," said John-Pascal Berrill, professor of the Department of Forestry and Wildland Resources at Humboldt State University. "The agencies must intervene to save aspen."

The LTBMU began the Aspen Community Restoration Project in 2009. The project moves aspen stands toward a

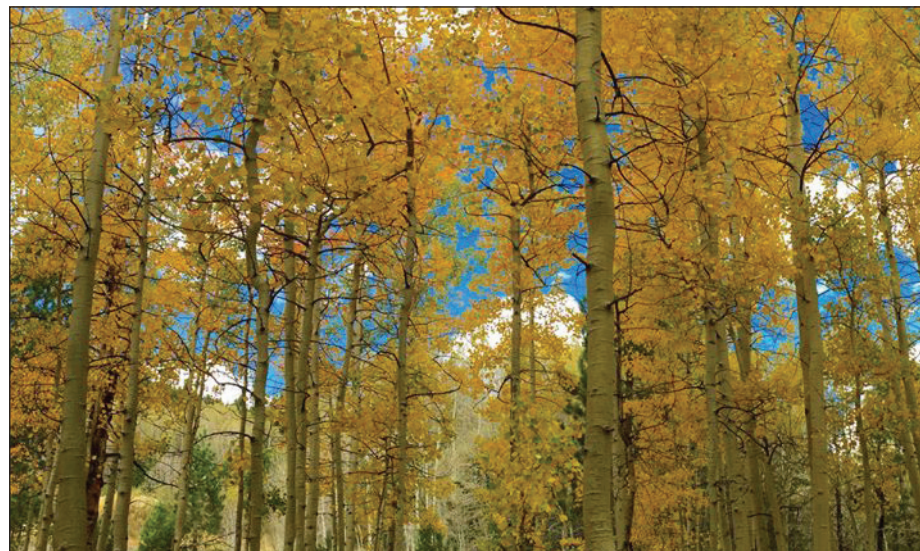


Photo: Jonathan Cook-Fisher, U.S. Forest Service
A healthy aspen stand in the Tahoe Basin.

desired condition where the upper canopy is dominated by aspen, conifers are less than 25 percent of the canopy, and aspen regeneration is vigorous.

"We are committed to using every technique we can and engaging in multiple partnerships to keep aspen thriving on the Lake Tahoe landscape."

Jeff Marsolais

LTBMU Forest Supervisor

"Aspen stands add a tremendous value to our natural environment," said LTBMU Forest Supervisor Jeff Marsolais. "We are committed to using every technique we can and engaging in multiple partnerships to keep aspen thriving on the Lake Tahoe landscape."

Since 2009, the LTBMU has thinned conifer trees from about 450 acres of aspen stands. Many of these acres will need to be thinned again to help aspen regain dominance in the stand. This acreage may not seem like a lot, but there are many factors that slow aspen restoration work in the Lake Tahoe Basin.

Aspen stands exist in stream environment zones, which are known for sensitive soils. Aspen stands are also often in hard-to-reach roadless areas. These two factors make it difficult to use ground-based mechanical equipment in aspen

forests. Instead, the Forest Service typically hand thin conifer trees in aspen stands and piles the wood for burning at a later time.

The Forest Service's restoration crew and recently the Washoe Tribe Calaveras Healthy Impact Product Solutions (CHIPS) crew have been instrumental in restoring aspen in the Tahoe Basin.

"The aspen trees were and still are very important to the Washoe People," said Washoe Tribe Chairman Irvin Jim. "We call aspen *Dtash off Be- Hazing*."

LTBMU partnered with Humboldt State University to evaluate the effects of restoration approaches on aspen stands, and after years of restoration work, the university found positive results. "We're seeing phenomenal regeneration of aspen

after the removal of conifers," said Berrill.

The LTBMU has also partnered with Will Richardson of the Tahoe Institute for Natural Science (TINS), a local nonprofit organization, to assess the bird community response to aspen restoration. The number and abundance of bird species has increased in restored aspen stands.

"Removing conifers doesn't appear to have a direct negative effect on bird communities," said Richardson. "This is especially consistent with bird abundance, as birds were present immediately following treatment and in years after."

The Satin Moth

Conifer trees aren't the only impact on Tahoe Basin aspen. The satin moth, an invasive moth from Europe and western Asia, is responsible for the recent death of large stands of aspen in the Lake Tahoe Basin and nearby areas. The young larvae feed on the aspen leaves to the point that trees can be completely stripped of foliage. Severe damage, like leaf eating year after year, can cause growth loss and even tree mortality.

The LTBMU is proud to be recognized by the Tahoe Regional Planning Agency for a 2017 Best in Basin Award for valuable contributions to Lake Tahoe through the Aspen Community Restoration Project. Read more about the Forest Service's award on pages 14-15.

Stephanie Coppeto is a wildlife biologist and the leader of the Aspen Community Restoration Project with the U.S. Forest Service.

Aspens and arborglyphs

Aspen stands at Tahoe have historic value. Basque shepherders of the late 19th and early 20th centuries carved arborglyphs—pictures and writings that documented their lives—in the aspen bark. One stand being restored has over 350 carvings on individual aspens documented by Jose Mallea-Olaetxe in his book "Speaking Through the Aspens: Basque Tree Carvings in California and Nevada." The carvings contain art, history, descriptions of resource conditions, and the movements of individuals across the landscape. "The health of these stands are important to the protection of these repositories of historical information," said LTBMU Heritage Resource/Tribal Relations Program Manager John Maher.



Photo: U.S. Forest Service
One of the aspen arborglyphs found in a restored stand.

'Team Tahoe' earns praise at summit

Heller, Feinstein praise Environmental Improvement Program's success

By Tom Lotshaw

TAHOE REGIONAL PLANNING AGENCY

Meeting at Nevada's Sand Harbor State Park for the annual Lake Tahoe Summit in August, Tahoe's congressional representatives pledged to keep working together and with local, state, and private sector partners to restore Tahoe's environment, improve forest health, and confront climate change.

"We must continue to prove Lake Tahoe is not and never will be a partisan issue," Sen. Dean Heller (R-Nevada), the summit's host, told an audience of about 500 people. "I think together with our leadership, and your leadership on the ground, we can continue our efforts to secure a healthy and prosperous future for the entire basin."

Heller was joined at the 22nd annual summit by Sen. Dianne Feinstein (D-California), Sen. Catherine Cortez Masto (D-Nevada), Rep. Tom McClintock (R-California), Rep. Mark Amodei (R-Nevada), and Rep. John Garamendi (D-California).

The summit's keynote speaker, Sen. Lisa Murkowski (R-Alaska), said Congress has been working to appropriate funding authorized by the Lake Tahoe Restoration Act, which calls for up to \$415 million in federal funding over seven years to help pay for projects to reduce stormwater pollution that harms Tahoe's clarity, restore wetlands and other natural areas important to watershed health, fight invasive species, and thin forests to reduce wildfire risk.

"You should be very proud of this collective, bipartisan, and across-state-line progress you have made," Murkowski said. "When you recognize the value and importance of one of the largest, clearest, and deepest lakes in the world, know that we're all going to be working together to Keep Tahoe Blue for this and future generations."

Sen. Feinstein praised the ongoing accomplishments of "Team Tahoe," more than 50 local, state, federal, tribal, nonprofit, and private sector partners in the Environmental Improvement Program. She said she's proud of the work to plan, fund, and implement projects that conserve and restore Lake Tahoe's environment.

"We've completed 627 improvement and restoration projects and 148 are



Photos: Tom Lotshaw

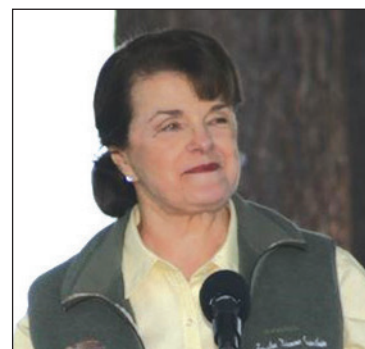
The crowd at Sand Harbor listens to speakers at the annual Lake Tahoe Summit.

underway," Feinstein said.

Through a mix of local, state, federal, and private funding, those projects have upgraded 780 miles of roads to reduce stormwater pollution, built or improved 150 miles of bike and pedestrian paths, thinned 75,000 acres of forest to reduce wildfire risk and improve forest health, restored 20,000 acres of wildlife habitat and 1,700 acres of stream environment, and opened nearly 3,200 feet of shoreline for public access.

Much has been accomplished by Team Tahoe, but much more remains to be done, Feinstein said, adding that while wildfire is the most destructive threat facing Lake Tahoe, it is only one of many serious threats from climate change.

"The hot summer season has increased by 26 days over the last 50 years. Water temperatures are rising half a degree each year—that's 14 times faster than the historical average," Feinstein said. "Climate change allows invasive species to thrive. It increases the amount of dead trees that fuel wildfires. It upsets the delicate balance of algae that gives the lake its deep blue color. Solving this problem will require a global effort, and to solve it here is going to require for the



"Solving (climate change) will require a global effort, and to solve it here is going to require for the next 20 years a rejuvenated Team Tahoe."

Sen. Dianne Feinstein

next 20 years a rejuvenated Team Tahoe."

At this year's summit, thick smoke lingered in the Tahoe Basin from large wildfires near Yosemite National Park and Redding.

Rep. McClintock said forest management and wildfire prevention must be top priorities. "For many years, forest management and fire prevention took a back seat at these summits, but now nature is screaming its warning at us through the fires that rage throughout the West," McClintock said.

Feinstein and Rep. Garamendi urged everyone who cares about Lake Tahoe

and its environment to join Team Tahoe and help protect and restore the national treasure.

"When everybody buys in and works together, from the federal and state governments to local communities and the private sector, great things can be accomplished," Feinstein said.

"I just want to say Team Tahoe is an open club. We so welcome your participation. There are a number of organizations you can join, you can contribute to. You can show up. Ladies and gentlemen, this lake still needs help."

Development rights system changes approved

Update streamlines process for acquiring and transferring rights for environmental enhancements

By Adam Jensen

TAHOE REGIONAL PLANNING AGENCY

Getting environmentally beneficial, economically feasible redevelopment on the ground in the Lake Tahoe Basin recently got easier.

The Tahoe Regional Planning Agency Governing Board unanimously approved changes to the basin's development rights system in October. The changes take effect Dec. 24, 2018.

The approval marks a milestone in a more than three-year process to change a system that is key to the Region's growth management and critical to achieving many environmental standards, known as thresholds. Changes to the development rights system were guided by a collaborative working group process funded by TRPA and the California Tahoe Conservancy. The working group included representatives from the environmental and business sectors, state land banks, the California Attorney General's Office, and the TRPA Advisory Planning Commission and Regional Plan Implementation Committee.

"We selected the best experts in the field to help the working group and members of the public generate ideas," said John Hester, TRPA's chief operating officer. "This open process resulted in important changes that all parties supported. We really appreciate the participation of all members of the working group and the community."

Development rights are land-use rights required for certain types of construction, like commercial space or hotel rooms, in the Lake Tahoe Basin. The update to the development rights system streamlines the process for acquiring and transferring rights. It will also accelerate the restoration of sensitive lands, maintain and improve environmental thresholds, and not have adverse impacts on the environment.

"When we started this process of dealing with development rights, a Governing Board member told me we would never get anybody to agree to anything," said Clem Shute, TRPA Governing Board member and chair of the working group. "Now the package which emerged from all the meetings is virtually unopposed. It may be the first time TRPA has undertaken something this complicated and not drawn fire."

The updated system expands the



Photos: Tahoe Regional Planning Agency
The update to the development rights system streamlines the process for acquiring and transferring rights, allowing developers to remove older developed areas and replace them with projects with environmental and aesthetic improvements that help the lake and improve the local economy. The update will also accelerate the restoration of sensitive lands, maintain and improve environmental thresholds, and not have adverse impacts on the environment. These photos are of an area of Park Avenue at Stateline.

eligibility of residential bonus units for affordable, moderate, and achievable housing in the Lake Tahoe Basin. The incentives are intended to encourage housing for different income levels, from very low income up to what some refer to as the "missing middle" — housing for those earning above the area median income yet still not enough to afford the median home price.

October's updates also eliminate overlapping approvals and streamline transfers of development rights. The changes allow conversions between different types of rights — commercial floor area (CFA), tourist accommodation units (TAU), and residential units of use (RUU) — using environmentally neutral

exchange rates. Allowing the conversion of one type of development to another is intended to provide greater flexibility and simplicity to the system, while maintaining the overall development cap set forth in the Lake Tahoe Regional Plan.

Local land banks will also be more involved in the development rights system following October's approval. Acquisitions by land banks have helped speed up sensitive lands restoration and provide a reliable inventory of development rights. Since the adoption of the 1987 Lake Tahoe Regional Plan, local land banks in California and Nevada have played a crucial role in reducing negative environmental impacts from development in the Lake Tahoe Basin.

"The 2012 Regional Plan was a paradigm shift for the basin that realized the potential in private investment in meeting our regional plan goals and policies," said Jen Self, TRPA senior long-range planner. "With redevelopment, we see environmental improvements such as the installation of stormwater systems, scenic upgrades, traffic and streetscape improvements, and better, energy-efficient buildings. These changes are about making the development rights system more flexible to encourage this type of redevelopment while still maintaining our environmental protections."

Adam Jensen is an environmental education specialist at TRPA.

Meadow acquisition key to reducing sediment

206-acre purchase of crucial wetland essential to restoring Upper Truckee River

By Jeff DeLong

SPECIAL TO TAHOE IN-DEPTH

The successful public acquisition of the largest remaining private parcel along the Upper Truckee River marks a milestone in efforts to restore a problem-plagued section of Lake Tahoe's largest tributary.

In April, the Tahoe Resource Conservation District closed the \$8.3 million acquisition of Johnson Meadow, a 206-acre stretch of the river located in South Lake Tahoe just upstream of U.S. Highway 50.

The wetland area, grazed for generations and dramatically altered from its natural state, has long been targeted as a centerpiece of long-term plans to restore the lower section of the Upper Truckee River.

It's hard to exaggerate the importance of restoring Johnson Meadow to its natural state. The Upper Truckee River is the largest stream source of fine sediments entering Lake Tahoe, and those sediments are the prime pollutant responsible for robbing the lake of its famed clarity.

"The acquisition of Johnson Meadow is a huge deal for the overall success of restoring the Upper Truckee River," said Nicole Cartwright, executive director of the Tahoe Resource Conservation District.

The meadow's value caught the attention of the Tahoe Fund, the nonprofit organization formed to raise private money to support Environmental Improvement Program projects.

The Tahoe Fund secured \$50,000 in donations from both Barton Health and Heavenly Mountain Resort. That private funding was key to ultimately obtaining the \$8.3 million from California's Proposition 1 program to finance the meadow's purchase.

"It was just so important to get that last stretch into public hands," said Amy Berry, the Tahoe Fund's chief executive officer. "Our board said we think this is the most critical project in the basin and we'll do anything we can to help."

Challenges seen at Johnson Meadow are the same ones present along the entire lower stretch of the Upper Truckee River, where humans altered what was once a thriving river and wetlands system to meet their needs.

The result was creation of an unnatural straight-shot river channel that separated the river from its natural floodplain,



Photo: Special to Tahoe In Depth

The Upper Truckee River is the largest stream source of fine sediments entering Lake Tahoe. The acquisition of the 206-acre Johnson Meadow is a key piece of the overall work to restore the Upper Truckee to a more natural state and greatly reduce that sediment flowing into the lake.

allowing sediments to flow directly into Lake Tahoe and cloud its waters.

Restoration work — expected to commence in 2020 and cost between \$10 million and \$15 million — is designed to bring river function closer to nature's intent. A meandering river channel will be returned to the meadow, allowing water to spill over the wetlands and filter out sediments before they reach the lake.

Such changes will also come with dramatic benefits to wildlife and offer important recreational opportunities to Tahoe's residents and visitors.

"It really is the last big-scale piece," said Stuart Roll, senior environmental scientist with the California Tahoe Conservancy. "It is a vast expanse of the floodplain."

If restoration work at Johnson Meadow is still a couple of years away, it could be coming sooner along another vital reach of the Upper Truckee River — the marshland in the immediate area where the river flows into the lake.

Conditions at the Upper Truckee River Marsh were altered in the late 1950s when developers dredged and filled hundreds of acres to make way for the residential community of the Tahoe Keys.

At the marsh, where development proposals at one time included a 14-floor hotel, a golf course, and a condominium complex, the river channel was again cut into a straight-shot canal. The river lost its natural filtering ability.

The California Tahoe Conservancy has spent about \$14 million to acquire private parcels in the marsh covering 500 acres. Planning for marsh restoration is complete. An environmental impact report for the project was certified in late 2015.

The project, expected to cost \$9 million or more, is planned to start in 2019 and take three or four years to complete.

Both Johnson Meadow and the marsh are central to restoring the lower 9 miles of the Upper Truckee River. Some 1,000 acres of wetlands and floodplain are expected to be restored, with some projects already completed and others pending. Partners include the Conservancy, the U.S. Forest Service, California State Parks, the city of South Lake Tahoe, and El Dorado County.

The planned relocation of holes beside the river at Lake Tahoe Golf Course in Meyers and restoration of the area is tied up in controversy. The Washoe Meadows Community Group sued California State

Parks in 2011 and 2012 to block the project on environmental grounds.

A court ruled in favor of the group in 2015, with that conclusion upheld by an appellate court two years later. California State Parks is currently circulating a revised plan for the project for public review, with the citizens group still opposed to the project.

Along the entire 9-mile stretch of river, nearly \$60 million has been spent over the years to acquire sensitive land needed for planned restoration work. Another \$60 million will be needed to fund restoration planned over the next 10 to 15 years.

While needed money has yet to be secured, Roll said he is optimistic. California voters provided a boost with June's passage of Proposition 68, which will funnel some \$27 million to the Conservancy for conservation projects.

When it comes to returning health to the Upper Truckee, each piece of the puzzle is important.

"We're looking at the cumulative benefits of all these projects together," Roll said. "What we're seeking is to get a functioning wetland habitat and ecosystem."

Proposal eyes new approach to Keys invasives



Photo: Drone Promotions

Controlling aquatic invasive species in Lake Tahoe is one of the highest priorities for the Lake Tahoe Environmental Improvement Program. Land managers around the lake have identified the Keys as a top-priority location for controlling and managing invasive weeds.

Goal is to reduce area's weeds by at least 80 percent and limit expansion to rest of Lake Tahoe

By Adam Jensen

TAHOE REGIONAL PLANNING AGENCY

With the goal of finding a local solution to a lake-wide problem, a diverse group of local citizens, public agencies, and nonprofits has organized to address aquatic invasive species issues in the Tahoe Keys.

Zephyr Collaboration is facilitating the new collaborative approach to inform the environmental documents for the Tahoe Keys Lagoon Restoration Project. Combating and controlling aquatic invasive species in Lake Tahoe is one of the highest priorities for the Lake Tahoe Environmental Improvement Program. Land managers around the lake have identified the Keys as a top-priority location for controlling and managing invasive weeds.

The restoration proposal for the Keys recommends a suite of control actions that includes non-chemical treatments of aquatic invasive species, such as the placement of bottom barriers, and chemical treatments such as targeted herbicide application, among others.

"We've been successful eradicating

localized populations of aquatic invasive plants in other areas of the lake," said Dennis Zabaglo, aquatic resources program manager for TRPA. "We know we need to focus on our greatest challenge, which is the Keys."

The Tahoe Keys is a large private homeowners' development and commercial marina built in the 1950s and '60s within the Upper Truckee Meadow at the southern end of Lake Tahoe. It consists of 1,529 homes covering 372 acres of land and 172 acres of interconnected waterways, with two outlets to Lake Tahoe. Aquatic invasive plants infest more than 95 percent of the Tahoe Keys lagoons.

The Tahoe Keys Property Owners Association has attempted to control aquatic invasive plants in the lagoons and has employed numerous methods to control aquatic invasive species. Erosion control measures to reduce nutrients reaching the lagoons, bottom barriers to control the spread of the plant species, and a boat back-up station and bubble curtain to prevent the spread of plant fragments are among the methods in use.

Recognizing that complete eradication of aquatic invasive plants in the community is most likely infeasible, the goal of the restoration is to reduce weeds in the Keys by at least 80 percent to bring the infestation under control and limit its expansion into Lake Tahoe.

The proposed testing of herbicides to combat the aquatic invasive plants is a controversial issue at Lake Tahoe. Some believe herbicides should never be used in the lake and priority should be put on non-chemical treatment methods because of the sheer size of the infestation. Others believe herbicide use is the only option at this point to curtail and treat the aquatic invasive plants in the Tahoe Keys before populations spread to other parts of the lake.

A chemical means of control has never been used in the waters of Lake Tahoe and requires environmental review and approvals by the Tahoe Regional Planning Agency, the Lahontan Regional Water Quality Control Board, and the California State Water Board.

Zephyr Collaboration will serve as a neutral third party working on

behalf of all stakeholders to conduct an assessment, complete a collaborative process design, and convene and facilitate a decision-making process to guide the joint environmental document needed to implement large-scale control actions within the Keys.

Work on the environmental document and the collaborative process will happen together, with public involvement throughout.

"Collaboration brings new ideas to the table and a deeper understanding of people's perspectives," said Kimberly Caringer, TRPA's environmental improvement division manager. "When people really roll up their sleeves and work together on a solution, they become invested in the long-term success of a project."

A similar collaborative stakeholder process was recently undertaken as part of the Shoreline Plan to develop a set of policies along the Lake Tahoe's shore to enhance recreational experiences and protect the environment. TRPA's Governing Board unanimously approved the plan in October.

Rare birds discovered on East Shore

Goshawk and spotted owl nests on Nevada side to be studied, protected

By Kathryn Reed

SPECIAL TO TAHOE IN DEPTH

While their calls are distinctive to those who know what to listen for, the Northern goshawk and spotted owl are even harder to lay eyes on. But that's just what a team of researchers in the Lake Tahoe Basin did.

These rare birds are native to the basin, even if the average person has never seen or heard one.

The Nevada Department of Wildlife (NDOW) and the Great Basin Institute in 2015 and 2016 found nests for each species in Lake Tahoe Nevada State Park, about 3.5 miles from each other.

"As top predators in their environment, they are indicators of a healthy forest. If they inhabit an area and are able to successfully reproduce there, it can be an indication that there is suitable foraging habitat, a sufficient prey base, suitable nest trees, and few disturbances," Mark Enders, NDOW wildlife biologist, said. "Forests with these characteristics are considered healthy, productive forests, and generally benefit many different wildlife species."

Researchers set out to determine if there were active nests on the East Shore so officials could then help with habitat conservation.

"We were able to locate nesting territories using broadcast surveys, where a goshawk or spotted owl call was played aloud on a portable speaker, and the surveyor vigilantly listened for responses," Enders explained. "Goshawks and spotted owls are considered rare on the landscape, so it was an exciting surprise to find a previously unknown nesting territory for each species. Both species have nested on the East Shore in the past, but there were zero known active nests for either species on the Nevada side at the time these surveys began in 2015."

In the intervening years, monitoring has continued with the goal to document nesting activity. Not much is known about trends of these animals in the basin, so the ongoing observations will give researchers solid data.

Northern goshawk and spotted owls have been known to make various locations on the California side of the basin their home. According to Enders, the highest number of goshawk nests recorded in the basin was 10, with as few



Photo: Mark Enders, Nevada Department of Wildlife
A pair of spotted owls in the Tahoe Basin.

as two. Spotted owls are rarer; at times there have been none in Tahoe, with four being what he called a "good year."

The two like similar habitat — old-growth forests. There isn't much left in the basin because of the decimation caused during the Comstock era that led to clear cutting of the forests for the silver mines to the east.

Still, their nests are often not right next to each other because the goshawks are predators of spotted owl nestlings.

Even if there are no old-growth trees for them to nest in, a large-diameter tree with a complex canopy structure can be home.

Wildfire, climate change, and people are problematic for both species.

"The greatest risk to their habitat in our region is wildfire, although any event that alters the forest landscape or creates disturbance within the core of their nesting territory has the potential to make an area unsuitable for these two species," Enders said.

Scientists for years have said climate change is going to bring less snow to the Sierra. Tree mortality caused by the recent five-year drought and beetle infestation have also taken their toll. This impacts habitat for all species, not just these two endangered birds. With a changing landscape for other creatures, it could mean the food chain for these raptors could be negatively impacted.

The California spotted owl that calls Lake Tahoe home is a subspecies that is being considered for environmental protection. The northern spotted and Mexican spotted owl are already protected by the Endangered Species Act.

"Spotted owls are generally facing declines across most of their range," Enders said. "In much of Nevada, goshawks are experiencing declines due to poor health of the aspen stands that they rely on for nesting, but their status at Lake Tahoe, where they nest in conifer, is unclear. They are definitely rare."

Also at the federal level, both are protected under the Migratory Bird Treaty Act of 1918.

It's not just the federal government that has taken an interest in the preservation of these creatures. Both are listed as Species of Conservation Priority in Nevada, Species of Special Concern in California, and Sensitive Species by the Lake Tahoe Basin Management Unit. This means protecting their habitat is likely to take precedence over anything else.

Keeping people out of the nesting area is also key. The 10.5-mile multi-use Capital to Tahoe Trail was originally slated to go through the goshawk territory.

"By working with our partners we actually have a better alignment than when we first proposed this project to them," Jeff Potter with the group Muscle

Northern goshawk facts:

- Most have red eyes
- Wing span of 40 to 46 inches
- Height is 21 to 25 inches
- Females can be 25 percent larger than males
- Diet consists of jays, doves, robins, woodpeckers and other large-bodied birds. They also eat mammals like squirrels and rabbits.

Spotted owl facts:

- Nocturnal animal
- Wing span about 48 inches
- Height on average is 18 inches
- Males are smaller than females
- Diet includes flying squirrels, mice and other small rodents.

Powered said. That group along with Carson City Trails is hoping to have the project scoped in 2020. Seven miles of it is on U.S. Forest Service land, with the remainder on State Parks property. The latter is where the nests are.

"Mark (Enders) was very helpful, as well as Maureen (Easton) with the U.S. Forest Service in helping us with an alignment that will avoid goshawk habitat and also provide users with a wonderful outdoor experience," Potter said.

Enders' work was recognized in 2018 when he was nominated for a Best in Basin award. This is a program the Tahoe Regional Planning Agency started in 2000 to acknowledge projects that excel at planning, implementation, and compatibility with Lake Tahoe's environment and communities. See the 2017 Best in Basin winners on the next page.

"The most satisfying thing about the nomination was the opportunity to bring more attention to wildlife-related work that occurs in all corners of the Tahoe Basin every year," Enders said. "There are many state, federal, and other partner biologists who are developing and implementing projects to help protect the Tahoe Basin's wildlife species, and much of that work flies under the public radar. I am lucky to work and collaborate with several other biologists on wildlife conservation at Lake Tahoe, and that is one of the highlights for me."

Kathryn Reed is a freelance writer.

Best in the Basin

TRPA honors nine projects for environmental, community benefits

By Tom Lotshaw

TAHOE REGIONAL PLANNING AGENCY

In October, TRPA recognized nine projects completed in 2017 with Best in Basin awards. The projects built new mountain bike trails, reduced stormwater pollution, overhauled roads to improve bicycle and pedestrian safety, reduced water and energy usage, improved forest health and wildfire preparedness, and opened new businesses to help communities thrive.

Now in its 28th year, TRPA's annual Best in Basin awards showcase projects that demonstrate exceptional planning, implementation, and compatibility with Lake Tahoe's environment and communities. Here's a rundown of this year's award-winning projects:

1. Angora Ridge and Mule Deer Trails Project: Tahoe Area Mountain Biking Association and U.S. Forest Service Lake Tahoe Basin Management Unit partnered to build 5 miles of trails in an area devastated by the 2007 Angora Fire. The project was a strong partnership that shows how the community continues to come together and rebuild after the fire. These trails connect to existing trails in the area and lay the groundwork for future improvements. Volunteers contributed more than 2,000 hours to help build the trails.

2. The Lodge at Edgewood Tahoe: Following an impressive overhaul of its golf course to restore wetlands, stream environments, and fish and wildlife habitat, Edgewood Properties built this world-class lodge in the pines with amazing views and access to Lake Tahoe. The lodge was recently certified as a LEED Silver building for its sustainable design and construction and energy efficiency.

3. Kings Beach Commercial Core Improvement Project: Placer County and partners overhauled 1 mile of state Route 28 in Kings Beach and improved roads in neighborhoods adjacent to the commercial core. The project installed sidewalks and bike lanes to make the area more pedestrian friendly; reduced coverage and installed stormwater infrastructure to fix drainage issues and treat stormwater runoff that harms Lake Tahoe's clarity; and helped rejuvenate Kings Beach.

4. Meyers Stream Environment Zone/Erosion Control Project: El Dorado County installed numerous stormwater improvements along the roadways of Arapahoe, Bakersfield, Choctaw, Country Club, East San Bernardino, Pioneer, San Diego, Santa Fe, Sioux, and Ute, diverting stormwater to public lots where it can infiltrate into the ground and restore a 3.5-acre wetland. The project is estimated to reduce fine sediment stormwater pollution from the area by 72 percent, an estimated 51,000 pounds of fine sediment—or 25 tons—per year, making it the largest water quality project El Dorado County has ever done in the Tahoe Basin.



Photo: Tom Lotshaw

The U.S. Forest Service is restoring valuable aspen stands.



Photo: Ben Fish

A mountain biker cruises along Angora Ridge.



Photo: Tom Lotshaw

Part of El Dorado County's stormwater system that is helping restore a 3.5-acre wetland in Meyers.



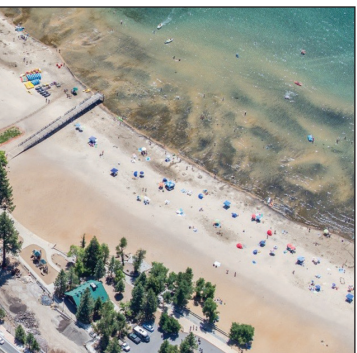
Photo: Placer County

An aerial view of Kings Beach after its commercial core improvement project.



Photo: Tom Lotshaw

South Lake Brewing Company creates a lively gathering place.



Bill Olin and South Lake Brewing Company overhauled a vacant hardware store sitting empty for more than five years near the “Y” into a thriving new brewery. The project redid everything from the outside facade and landscaping to the interior, turning the empty building into a community gathering place and part of Lake Tahoe’s growing brewery industry. The brewery has also helped fundraise for other projects, using proceeds from beer sales to help pay for mountain bike trail improvements and the Lake Tahoe Fire Academy scholarship fund.



Photo: Tom Lotshaw
The Lodge at Edgewood Tahoe is named a LEED Silver certified building for its sustainable design and construction and energy efficiency.



Photo: Tom Lotshaw
Terry and Phyllis Powers removed more than 2,000 square feet of turf through the utility district’s turf buy-back program.



Photo: Tom Lotshaw
Novus Select converted an old building on Ski Run Boulevard to make the headquarters for its world-renowned video and photography agency.

5. South Lake Brewing Company: Bill Olin and South Lake Brewing Company overhauled a former hardware store sitting empty for more than five years near the “Y” into a thriving new brewery. The project redid everything from the outside facade and landscaping to the interior, turning the empty building into a community gathering place and part of Lake Tahoe’s growing brewery industry. The brewery has also helped fundraise for other projects, using proceeds from beer sales to help pay for mountain bike trail improvements and the Lake Tahoe Fire Academy scholarship fund.

6. 1127 Lone Indian Trail/South Tahoe Public Utility District Turf Buy-Back Program: Terry and Phyllis Powers partnered with the South Tahoe Public Utility District, Natural Expressions Landscaping, and Earth and Stone Landscapes to remove more than 2,000 square feet of turf in their yard and replace it with a mosaic of flowers, native plants, and hardscape that will save thousands of gallons of water annually. In the 10 years of the utility district’s popular turf buy-back program, 339 projects have been completed, removing 409,876 square feet of turf to reduce energy usage and save millions of gallons of water each year.

7. Aspen Community Restoration Project: Aspen stands are ecologically significant because of the wildlife, plants, fungi, and soil processes they support, yet they represent only 2 percent of National Forest land at Tahoe. Some aspens also bear arborglyphs, carvings by Basque sheep herders in the late 19th and early 20th centuries. One threat aspen stands face is encroachment by conifers. Without natural disturbances like wildfire, conifers can rapidly out-compete and displace aspen stands. Since 2009, the U.S. Forest Service Lake Tahoe Basin Management Unit has reduced conifer densities in approximately 450 acres of aspen stands at Tahoe to protect the stands. The Forest Service has partnered with university researchers to evaluate the success of this work and with a local nonprofit to monitor bird community responses. It has also incorporated education about aspen stands and guided walks from the Taylor Creek Visitor Center to help teach people about aspen and their cultural and environmental values in Tahoe’s forests.

8. Defensible Space Collector App: Clearing brush and ladder fuels to create defensible space around homes and businesses is a critical part of wildfire safety and preparedness at Lake Tahoe. Cal Fire, the Tahoe Resource Conservation District, and the Tahoe Fire and Fuels Team partnered to develop a new application that allows all fire agencies at Tahoe to report and share information about defensible space inspections and compliance in one shareable tool. This will provide a holistic approach to identify fire prevention and outreach needs at the homeowner and neighborhood level to help agencies and residents continue to make strides in wildfire preparedness at Tahoe.

9. Novus Select: Corey Rich, Chris McNamara, Sierra Sustainable Builders, and David Goldman partnered to turn an old building on Ski Run Boulevard in South Lake Tahoe into the headquarters office for Novus Select, a world-renowned video and photography agency. With their new business location near Heavenly Mountain Resort and the lake, Rich and McNamara are encouraging others to see the area’s older buildings and vacant lots as a great place to live, work, and invest to help make South Lake Tahoe the outdoor recreation capital of the world.

New heritage display for Incline

Washoe shelter, short hikes bring Tahoe history to life

By Tom Lotshaw

TAHOE REGIONAL PLANNING AGENCY

Next summer, a small wooden shelter built at the Incline Village Visitor Center, known as a galis dungal, will be the starting point for short but immersive forest walks that reintroduce people to nature and help them learn more about Tahoe's indigenous tribes.

Ben Rupert, whose family descends from the Washoe Tribe and Duck Valley Shoshone-Paiute, built the structure with his son in June. Made of cedar bark on a frame of lashed cedar, the galis dungal, or "winter hut," is a traditional shelter of the Washoe.

The galis dungal is what the Washoe built to house themselves as they traveled between Washoe and Carson valleys and *da ow a ga*, the sparkling shore of Lake Tahoe, each year to fish, hunt, and harvest pine nuts and other edible plants.

Rupert has built several galis dungals at Tahoe, harvesting bark from fallen cedar trees after allowing it to cure for up to a year.

Inside the Incline Village Visitor Center is a new display of traditional Washoe items Rupert and his son have made: A cradle board, moccasins, baskets, a bow and a quiver of arrows. "We're just trying to raise awareness of Lake Tahoe and its significance to the Washoe people in a different way," Rupert said.

Jacquie Chandler, director of the nonprofit group Sustain Tahoe, is working to make the new galis dungal and Washoe heritage display a starting point for visitors to the region. From the visitor center, people will be able to take walks to learn about Tahoe's environment, sustainability and stewardship, and the Washoe's heritage at the lake.

Penelope Curtis, a co-creator of this project who has a background in California cultural heritage tourism and arts and heritage preservation, said the project "opens the door for locals and visitors alike to learn how art, culture, and heritage in a recreation activity are all interconnected."

The project will help people learn about the Washoe, their connection to Tahoe, and how they lived sustainably for thousands of years here through a close relationship to the land, water, and wildlife.



Photo: Penelope Curtis



Photo: Tom Lotshaw

Ben Rupert (top photo) peels off bark for the galis dungal (left). The bark is lashed to cedar poles (below) to create the hut, a traditional Washoe shelter used by tribe members when they traveled between Washoe and Carson valleys to Lake Tahoe each year to fish, hunt, and harvest pine nuts. The Ruperts have also made moccasins, baskets, a bow, and a quiver of arrows for a display inside the Incline Village Visitors Center.



Photo: Penelope Curtis

*"Ha-lung-gnah wah
leh-iw lay-ee Wa-
shih-sh-iw"*

"We are still here."

Melba Radow

*Washoe Cultural Resources
Advisory Council*

Walks from the winter hut will also help reintroduce visitors to nature and build a stronger appreciation and respect for Tahoe's environment through "shinrin yoku," a Japanese form of nature therapy known as forest bathing, or forest immersion.

Felix Brosch, a certified nature guide and outdoor leadership teacher at Lake Tahoe Community College, will lead slow walks from the galis dungal into the forest along Third Creek.

"For me, it's an initiation for people to experience not just the five senses, but the sense of imagination," Brosch said. "I call it rest and digest, a vision quest where we unplug and slow down. My intent is to connect people to nature and create stewardship and reciprocity so people have a sense of hope and a feeling that we can be part of the solution."

As part of the project, partners are also working on guidebooks and other materials to help people learn about the environment, the Washoe people, and how to enjoy Tahoe and improve the region's sustainability.

"We're looking forward to this," said Greg Long, director of operations and finance for the Incline Village/Crystal Bay Visitors Bureau. "We have a lot of people coming in looking for short walks and things to do, so we're looking forward to being able to direct people to this heritage display and this trail. It's something fulfilling that we can send people to right out front of our visitor center."

For more information, visit www.sustaintahoe.org.

Desolation Wilderness gets a little TLC

Tahoe Rim Trail Association and Tahoe Fund partner to restore popular backpacking area

By Tahoe Fund Staff

Desolation Wilderness is a 63,960-acre protected wilderness area southwest of Lake Tahoe. An iconic American backpacking destination, Desolation is crisscrossed by two famous long-distance trails, the Pacific Crest Trail and the Tahoe Rim Trail.

The popularity of the area has caused problems with erosion, water quality, safety, and the recreational experience, however, and prompted two groups to join forces to rehabilitate sections of the wilderness area.

The Tahoe Rim Trail Association, a community of volunteers and members committed to enhancing and preserving the Tahoe Rim Trail, and the Tahoe Fund, a nonprofit organization that funds key environmental projects around the Lake, partnered last summer on a multi-year project to rehabilitate areas of the trail. The areas targeted are near the northern boundary of the wilderness, Phipps Creek, Middle Mountain, and Middle Velma Lake.

“Restoration work is critical because the Tahoe Rim Trail in Desolation runs alongside pristine alpine lakes and crosses numerous alpine streams,” said Chris Binder, director of trail operations at the Tahoe Rim Trail Association. “Most of the trail was laid out and built generations ago when knowledge of sustainable trail design was not widespread. As a result, the trail suffers from erosion that has been exacerbated in recent years by heavy use and large storm events.”

This erosion sends sediment from the trail into the lakes and waterways, many of which ultimately feed Lake Tahoe. The restoration work will harden the trail tread and mitigate erosion, protecting valuable wilderness and aquatic resources while minimizing the effect that recreation has on the landscape and ecosystems.

“We knew that funding this project would have a major impact, both on rehabilitating a beautiful section of trail, as well as engaging passionate, excited volunteers for work in the backcountry,” said Tahoe Fund board chair Katy Simon Holland. “It’s an honor for us to support the hard work being done out there over the next several years.”

This past summer, Binder worked alongside the Tahoe Rim Trail



Photos: Tahoe Rim Trail Association

Volunteers rehabilitated trails and areas near the northern boundary of Desolation Wilderness, Phipps Creek, Middle Mountain, and Middle Velma Lake.

Association volunteer crew for four days in the backcountry. American Conservation Experience youth crews also worked in Desolation for over a week. Both crews were supported by members of the Backcountry Horsemen of California Motherlode Unit, who spent several days packing supplies and equipment in and out by horse and mule. Work on the project will continue over

the next three years.

“For me, the best part of the workday is seeing how satisfied the volunteers are as they reflect on the work they have put into the trail,” Binder said. “Knowing that we are building stone structures such as steps and drains that will last for generations helps the volunteers appreciate that all their effort is worth the sweat and time.”

The project still needs the help of the community to succeed. The Tahoe Fund will match every dollar contributed to this unique project up to \$40,000 through the end of 2018. With the support of private donors, a wonderful section of trail can be restored for all to enjoy. Visit tahoeFund.org to help achieve this crucial match to prevent erosion and improve the trail through all seasons.

Treasured meadows targeted for rehabilitation

Although small, meadow areas have a big impact on water quality and wildlife

By Shana Gross
U.S. FOREST SERVICE

Outdoor enthusiasts love meadows for their beauty and the habitat they provide for plants and wildlife. A summer stroll through a beautiful mountain meadow can offer a breathtaking view of an array of wildflowers or a glimpse of wildlife, such as birds of all colors and sizes, aquatic species like fish and amphibians, and mammals that range from small rodents to large predators and scavengers like coyotes and bears.

Mountain meadows, also known as montane meadows, make up a relatively small portion of the Sierra Nevada landscape, but their ecological value far surpasses their footprint. Montane meadows are also some of the most vulnerable and easily impacted habitat types.

In the Lake Tahoe Basin, there are approximately 5,300 acres of meadows that are located at lake level up to almost 10,000 feet in elevation. Fire suppression, past grazing, changes in stream channel condition, trails and recreation, encroaching conifer trees, and changes in climate have impacted meadow health.

The U.S. Forest Service Lake Tahoe Basin Management Unit (LTBMU) is restoring six of Lake Tahoe's iconic meadows. The six meadows located in the southern portion of the Tahoe Basin selected for restoration include Baldwin, Benwood, Freel, Hellhole, Meiss, and Star.

"Healthy meadows are essential to the clarity of all waters within the Lake Tahoe watershed," said LTBMU Forest Supervisor Jeff Marsolais. "Meadows filter fine sediment from water flowing into Lake Tahoe and provide essential habitat for diverse plant and animal species. These meadows are also valued for their scenic qualities as they are often close to recreational facilities, such as trails, beaches, and campgrounds."

The Restoration of Fire Adapted Ecosystems Project aims to restore these six meadows using a variety of techniques, such as tree removal, stream channel repair, trail rerouting, willow planting, and prescribed fire. The goal is to restore the ecological systems in these meadows and to prepare them for natural disturbances such as wildfire.

Benwood and Star Meadows

In 2017, the LTBMU began restoration

work in two of the six meadows, Benwood and Star. The low-growing vegetation in these meadows, such as grasses, sedges, rushes, and flowers, are being crowded out by trees, especially at Benwood Meadow, which is actually made up of a larger and a smaller meadow (Benwood Meadow complex).

"When I visited the Benwood Meadow complex, I couldn't believe the number of trees that had grown within the larger of the two meadows. It was essentially a line of tall trees down the center of the meadow and also crowding in from all sides," said LTBMU wildlife biologist and co-leader of the project, Stephanie Coppeto. "Native plants such as willows that support sensitive species like the willow flycatcher were all being replaced by these trees."

Baldwin Meadow

In August 2018, the LTBMU began thinning trees from Baldwin Meadow as part of the Restoration of Fire Adapted Ecosystems, South Shore Healthy Forest and Fuels Reduction, and the Aspen Community Restoration projects.

Baldwin Meadow is about 120 acres and spans the west side of the access road to Baldwin Beach, a popular tourist destination near South Lake Tahoe. Many people may not have been aware that this area is actually a meadow because there were so many trees growing in it.

"We received a lot of interest from the public during our Baldwin Meadow restoration," said Coppeto. "It was great to see how many people asked about the health and happenings of their public lands."

The meadow condition was shaped by tree encroachment from lack of fire, past grazing, and heavy recreational use. Many of the trees cut during the project were piled to allow them to dry before burning them. Some of the trees were left whole on the ground to provide habitat for amphibians and small mammals.

The LTBMU successfully implemented prescribed fire operations in Baldwin Meadow this past November. The goal was to stimulate the regeneration and growth of meadow vegetation using low-intensity fire. Because the meadow soils were fairly moist, and became much wetter when the trees were removed, the footprint of the prescribed fire was fairly patchy. Following the prescribed



Photos: U.S. Forest Service

Baldwin Meadow (above) was choked with encroaching trees before crews thinned the area to restore its natural meadow characteristics (below).



"Healthy meadows are essential to the clarity of all waters within the Lake Tahoe watershed."

Jeff Marsolais

LTBMU Forest Supervisor

fire operations, and as the site moisture increases, more meadow habitat will be visible along with amazing wildflower blooms, beginning in 2019 and beyond.

"Restoration projects completed over the past 15 years have shown that these actions can reverse the effects of earlier land uses and restore health and function that occurred previously," said LTBMU hydrologist Craig Oehrli.

Funding for the restoration of Baldwin, Benwood, and Star meadows under the Restoration of Fire Adapted Ecosystems Project was made possible through the Southern Nevada Public Land Management Act and is part of the

basin-wide Environmental Improvement Program.

Looking toward the future, the Forest Service is seeking additional funding to restore the remaining three meadows — Freel, Hellhole, and Meiss — remove additional trees from Benwood Meadow, conduct prescribed fire operations in both Benwood and Star meadows, and draft environmental planning documents to restore other meadows throughout the Lake Tahoe Basin.

Shana Gross is the Central Sierra Province associate ecologist for the Pacific Southwest Region of the U.S. Forest Service.

Plan to address busy West Shore highway

Popular 12-mile stretch of state Route 89 the focus of new study

Morgan Beryl

TAHOE REGIONAL PLANNING AGENCY

State Route 89, a winding mountain road along Tahoe's West Shore, offers almost 12 miles of undeveloped shoreline and stunning panoramic views. This corridor is home to many landmarks, including Emerald Bay, Meeks Bay, Sugar Pine Point State Park, Baldwin Beach, Camp Richardson, and Pope Beach. Several small communities are tucked into the hillside and exude Tahoe charm. Seven trailheads provide easy access to trails, waterfalls, alpine lakes, and Desolation Wilderness. During the winter months, the surrounding peaks offer world-class backcountry skiing.

During peak summer seasons, state Route 89 experiences a high volume of traffic from a mix of users, including vehicles, public transit, tour buses, freight, pedestrians, and bicyclists. At times, demand exceeds the capacity of the roadway and recreation sites. Visitors often park in illegal areas with limited space and in dangerous rock-fall areas. Pedestrians often walk in the middle of the highway, creating unsafe situations.

The State Route 89 Recreation Corridor Management Plan, led by TRPA, the Tahoe Transportation District, and the U.S. Forest Service, brings together 17 agencies and organizations to develop transportation and visitor management strategies that address the corridor's high transportation and recreation demand.

"We are so glad to help lead this planning process that focuses on finding holistic solutions to our recreational and transportation issues on our treasured public lands," said Mike Gabor, one of the Forest Service's lead engineers.

The plan aims to improve safety, expand travel choices, enhance user experience, improve and leverage technological connectivity, preserve the environment, and promote the economic vitality of the corridor's recreation and businesses.

Tahoe Transportation District's Capital Program Manager Danielle Hughes said that "through innovation and partnership Tahoe can lead the way in providing an efficient, safe, and spectacular recreation experience."

As a first step, partners, with help from the land use design firm Design Workshop, are examining data on



Photo: Novus Select

During the peak summer season, state Route 89 experiences a high volume of traffic and parking problems.

roadway user counts, delay times, and parking turn-overs to understand what conditions increase congestion and decrease safety. Surveys provided insight into what residents and visitors like to do in the area, what accommodations improve or impact their experience, and how they feel about possible solutions.

Using this information, partners will propose projects and strategies to enhance user experience, reduce traffic and parking issues, improve emergency and year-round access, and preserve the natural and cultural resources of the area. The process brings together recreation management with transportation planning.

Tony Evans, an active member of the Meeks Bay Vista Property Owners Association, applauds the partners, stating "we have long lobbied for a path that highlights Rubicon and Meeks Bay's gorgeous views. The coordination involved in the process with our association to develop this portion of the path has been rewarding and will be a treasure for all to enjoy."

Over the next few months, partners will continue to convene and discuss potential solutions and hope to have a draft plan ready for public review in spring 2019.

To learn more about recreation



Photo: Novus Select

Congestion along state Route 89 can cause unsafe conditions for pedestrians and motorists.



Linkingtahoe.com helps visitors get around the basin

corridor planning and upcoming input opportunities, visit [www.trpa.org/transportation/plans-](http://www.trpa.org/transportation/plans-projects-and-programs/)

[projects-and-programs/](http://www.trpa.org/transportation/plans-projects-and-programs/).

Morgan Beryl is a senior transportation planner at TRPA.

Fanny Bridge undergoing critical makeover

Project will redirect traffic and ease congestion at North Shore crossroads

By Jeff DeLong

SPECIAL TO TAHOE IN DEPTH

Lake Tahoe's iconic 90-year-old Fanny Bridge, the site of one of the lake's most troublesome traffic chokepoints, is undergoing some big changes.

The Tahoe Transportation District is leading a \$35 million make-over to replace the aging structure and redirect state Route 89 traffic over a new bridge spanning the Truckee River farther downstream.

The project, combined with the planned construction of two nearby bicycle-pedestrian paths and roundabouts, is one of the priority projects identified under the Environmental Improvement Program (EIP). The EIP was established in the wake of then-President Bill Clinton's 1997 Lake Tahoe Summit as a long-term blueprint for improvements needed to protect and preserve Tahoe's fragile environment.

Changes sought at Fanny Bridge, located at the western gateway to Tahoe City, are long overdue, many agree. The spot has always served as a crossroads of sorts, dating back more than a century to when it served as a hub for trains and steam ships crisscrossing Tahoe's azure waters.

"Today it still is a crossroads but it's a crossroads that doesn't function very well," said Carl Hasty, executive director of the Tahoe Transportation District.

"This is a big priority," Hasty said.

During peak summer periods, northbound traffic on Highway 89 can jam up in a painful stop-and-go column sometimes stretching back to Homewood more than 6 miles to the south. At Fanny Bridge, that heavy traffic is in constant conflict with pedestrians and bicyclists in a situation inconvenient for all and sometimes dangerous.

"There are definitely long-standing issues in that area," said Nick Haven, division manager of long range and transportation planning at TRPA.

"At peak times it's pretty bad," Haven said. "It's maxed out."

"It is needed immediately and it's clearly needed to deal with what we know is coming," agreed Steve Teshara, chairman of the Tahoe Transportation District's policy board.

Addressing that issue and others is the



Photo: Drone Promotions

The \$35 million project to redirect traffic near Tahoe City and state Route 89 is a key element of the Environmental Improvement Program.

goal of the State Route 89/Fanny Bridge Revitalization Project, unanimously approved by the TRPA Governing Board in May 2015. The project, headed by the Tahoe Transportation District in cooperation with the California Department of Transportation, Placer County, and other agencies, commenced construction this spring and is anticipated to be complete by 2019, with much of the work occurring last summer.

The project involves the realignment of Highway 89, routing highway traffic through two roundabouts and over a new two-lane bridge spanning the Truckee River downstream near the Caltrans maintenance yard. Because about 60 percent of northbound traffic on Highway 89 turns left and heads toward Truckee, the change in road alignment is expected to significantly reduce traffic and user conflicts at Fanny Bridge.

"That will allow for much safer pedestrian and bike traffic at Fanny Bridge," Hasty said. "This really gives parity to motorists, bicyclists, and pedestrians."

The existing Fanny Bridge will be replaced with a new structure employing

the same railing design. The old road alignment will be taken over by Placer County and the area converted into a bikeable, walkable "river district" that can serve as a centerpiece for any number of community events.

"If you want to shut it down for a farmer's market, a music event, whatever, you can," Hasty said. "This is about making improvements that will allow the town center to function well."

In addition to improvements in the immediate Fanny Bridge area, the project includes construction of two bicycle and pedestrian trails. One would extend nearly a mile, linking Meeks Bay Resort to Sugar Pine Point State Park. The other would extend roughly 2 miles eastward from the Tahoe City area toward Carnelian Bay.

The State Route 89/Fanny Bridge project has similarities to the South Shore Community Revitalization project that would reroute highway traffic at Stateline and South Lake Tahoe. Both are designed to create a welcoming community center emphasizing more pedestrian- and bicycle-friendly environments. They will likely be the last projects of such scale in

the Tahoe Basin, said TRPA's Haven.

"Those two projects represent significant transformation designed to improve community, economy, and the environment," Haven said.

"I think it will be wonderful. I really do," Marguerite Sprague said of the opportunities to improve the Tahoe City community made possible by coming changes to the Fanny Bridge area.

Sprague is the former executive director of the North Lake Tahoe Historical Society, which operates the Gatekeeper's Museum adjacent to Fanny Bridge.

Sprague lauded broad public outreach by the Tahoe Transportation District and other agencies as they prepared plans for changes needed at a particularly challenging location.

"I was really impressed with how they got people involved," Sprague said.

The area will always be a hub of activity, but Sprague said she's confident the revitalization will make a significant difference in addressing existing problems at Fanny Bridge.

"It isn't going to be a magic solution, but I think it will really help," she said.

Prosperity Center focuses on improving housing

With choices limited, programs aim to improve options for Tahoe residents and workers

By Heidi Hill Drum

TAHOE PROSPERITY CENTER

Finding housing at Lake Tahoe can be a challenge. An estimated 75 percent of dwellings are second homes that sit vacant much of the year. The remaining 25 percent of the housing stock was primarily built before 1989, which means there are not many modern options for a new professional moving to the community.

If you work in the tourism industry, which tends to pay low wages, then housing options are further limited. Owning a pet significantly reduces your options even more.

So, what is a local worker to do?

The Tahoe Prosperity Center, Lake Tahoe's regional economic and community development organization, has convened the Housing Tahoe Partnership (tahoeprosperity.org/housing-tahoe/) to tackle this issue on the South Shore. The North Shore is also working on the issue through the Mountain Housing Council.

This collaboration is focused on transforming local housing options so that residents and workers can live, work, and thrive at Lake Tahoe. The partnership hopes to expand housing solutions to produce, maintain, upgrade, reuse, and unlock homes attainable for residents and workers in Lake Tahoe.

Tearing down old properties and building new, modern mountain housing is a win for the community, economy, and environment.

Community improvement happens because old motels currently being used for long-term housing are not safe nor appropriate for that use. Redeveloping old buildings into new housing is healthier for residents and businesses who need local workers.

Economic improvement occurs because local residents have a healthier place to live in town, close to shopping, jobs, and restaurants. Instead of spending their taxes and income outside of the Tahoe Basin, where they may live and commute, they can move closer to work and spend their revenue locally.

Revitalization projects on these older properties also helps the environment by incorporating improvements that reduce runoff. This work also reduces traffic and



Photos: Heidi Hill Drum
Revitalization of older properties helps the environment by incorporating improvements that reduce runoff, traffic, and road congestion.

road congestion — key contributors to the loss of Lake Tahoe's clarity.

Partners working together

The Housing Tahoe Partnership includes Vail Resorts, which needs seasonal worker housing, and Lake Tahoe Community College, which requires student and staff housing. It also includes the two chambers of commerce, representing a variety of local businesses, as well as Barton Hospital, which needs housing at a variety of levels to keep the hospital running smoothly.

"It does not work to look in the rear-view mirror to see where we are going

when it comes to housing policy," George Ruther, Housing Director for the Town of Vail, Colorado shared at the annual Tahoe Economic Summit. Now, the Town of Vail uses housing as an economic development strategy as they realized that for the community, businesses, and residents to thrive, investment in building and acquiring local housing is critical.

The Housing Tahoe Partnership agrees and is not looking back, but looking forward to positively transform Tahoe and ensure regional prosperity for all.

Heidi Hill Drum is the CEO of the Tahoe Prosperity Center.

What's being done

The South Shore's Housing Tahoe Partnership is also working on specific initiatives to improve the local housing situation. One of those groups, Progress for Tahoe, is spearheading "Tahoe Home Connection" to encourage second homeowners to make their homes available for long-term rentals or seasonal master leases, similar to Whistler's Home Run initiative (homerun.whistlerhousing.ca). Saint Joseph's Community Land Trust in South Lake Tahoe leases land to homeowners who place a deed restriction on their home to make it permanently affordable and recently began working with Barton Hospital on a program for some of its workforce. The El Dorado Community Foundation is working on various housing funding options, including a land bank and a fund for investors who want to invest in Opportunity Zones, of which there are two in the Lake Tahoe Region — both in South Lake Tahoe.

Most recently, TRPA adopted significant changes to its regulations that will create opportunities to build more local housing at levels that are affordable for seasonal resort workers, first year teachers, and staff at Lake Tahoe Community College.

How Nevada got such a great park

Iconic Lake Tahoe Nevada State Park pieced together from several unexpected sources

By Jay Howard
NEVADA DIVISION OF STATE PARKS

Before the arrival of white people, the only visitors to Lake Tahoe were the Washoe, who spent their summers at the lake fishing, hunting, and gathering seeds and medicinal roots. The Washoe set up camps near meadows close to the shoreline and next to the streams that fed the lake. The Washoe name for the lake was *da ow a ga*, which is considered by many to be the source for the name Tahoe.

The Washoe’s idyllic existence was forever changed in 1859 when silver and gold were discovered in Virginia City, 16 miles east of Sand Harbor as the crow flies.

Mining lured immigrants from around the world, and while gold and silver were being extracted in the Comstock, timber and water were being extracted from the Tahoe Basin to feed the mining frenzy. The timbers provided infrastructure for the mining complex and the Tahoe water provided the primary power of the time—steam.

Long before anyone dreamed of Lake Tahoe Nevada State Park along the East Shore, timber and water companies were purchasing wide swaths of the Tahoe Basin’s eastern shoreline and uplands to continue feeding the mining industry’s voracious appetite for wood and water. The Virginia and Gold Hill Water Company and the Sierra Nevada Wood and Lumber Company (in what would later become Incline Village) and the Carson Tahoe Lumber and Flume Company, headquartered at Glenbrook, were among the largest landowners.

The bonanza period of the Comstock Mining District, located below the mining camps of Virginia City, Gold Hill, and Silver City, Nevada, occurred between 1859 and the mid-1880s. Companies clearcut vast stretches of virgin, old-growth forest and siphoned millions of gallons of water a day from the Sierra. The thinking at the time was not of conservation or environmental protection but of development and expansion. People felt that the trees, waters, and minerals had been ‘given’ to the people bold enough to take them. Settlers and entrepreneurs felt free to harness the ‘wilds’ of the American West.

As mining decreased, the East Shore began attracting vacationers and visitors who built summer homes. By the early



Photo: Drone Promotions
Sand Harbor on a busy summer weekend. More than a million people visit Lake Tahoe Nevada State Park each year.

1900s, tourism firmly took hold as the dominant economy.

The acreage that would later become the park was largely acquired from two entities. First, George Whittell, a flamboyant millionaire from San Francisco, purchased vast amounts of logging company lands inside the Tahoe Basin in the 1930s, eventually acquiring 40,000 acres of Tahoe’s east shore from Crystal Bay to Round Hill.

Despite initial plans to build resorts at Sand Harbor and Zephyr Cove, Whittell came to value his privacy over development. He would later become known as the ‘accidental

environmentalist’ because his reluctance to sell land meant that the east side of the basin stayed in large contiguous parcels until his death in 1969.

The foundation stones of Lake Tahoe Nevada State Park were finally laid through a lease agreement with Whittell for 8.6 acres at the main beach at Sand Harbor in 1958. Nine years later, the state purchased more than 5,000 additional acres from the eccentric landowner.

Most of the park lands outside the basin were purchased from the Marlette Lake Water Company by the Curtis Wright Corporation in 1957. Curtis Wright needed the water to pursue a

federal missile-testing contract in Storey County. Wright later lost the contract and sold the land to the state of Nevada in 1963.

Through a fortuitous series of purchases and donations, the park grew into a fantastic assemblage of backcountry wilderness and precious Tahoe shoreline, set aside for future generations. More than 1 million people visit the park each year.

Jay Howard works for Nevada State Parks and has been in the Tahoe Basin for 19 years as a park supervisor and recreation representative for the Environmental Improvement Program.

Timeline: How Nevada pulled together the land for Lake Tahoe Nevada State Park

- 1958:** State of Nevada leases 8.6 acres at Sand Harbor from George Whittell.
- 1963:** Nevada purchases 5,378 acres of backcountry (Marlette Lake Water System lands) from the Curtis Wright Corporation for \$1.65 million. Management of 5,295 acres is given to the park in 1969.
- 1967:** Nevada uses eminent domain condemnation to acquire 5,300 acres from George Whittell for \$3 million.
- 1967:** State acquires 3.2 acres at Cave Rock. The Cave Rock Boat Ramp was built in the early 1960s on the crushed rock spoils of the second of two Highway 50 tunnels, the first bored in 1931 for a roadway through the rock, and the second in 1957.
- 1969:** About 1,600 acres purchased in North Canyon from the

- Whittell Estate.
- 1969-1970:** 1,140 acres purchased at Spooner Lake from the Whittell Estate. The facilities of Spooner Lake were developed in the 1980s after a dam was built in 1982, and 13 miles of the Tahoe Rim Trail were completed through the park in 1989.
- 1971:** Sand Harbor is developed and officially dedicated on Oct. 1.
- 1988:** 542 acres are donated to Nevada State Parks from Jack Van Sickle for the Van Sickle Bi-State Park. 28 acres are added later and California adds 175 acres. By 2005, the total comes to 745 acres. Van Sickle Bi-State Park was developed as a trailhead in 2011.
- Park total:** 14,083.2 Acres

Sand Harbor bike path nearly finished



Photos: Drone Promotions
The bike path from Incline Village to Sand Harbor will reduce safety hazards from parking along Nevada state Route 28.

Circling the lake with bike paths a key element of vision for Tahoe

Continued from page 1

and cutting back on the pollution they produce is a primary goal of the Environmental Improvement Program, a long-term blueprint to achieve top environmental goals throughout the Tahoe Basin.

Circling the lake with bike paths is an important part of the vision for Lake Tahoe.

“We definitely want to see trails all around the lake so people have that alternative,” said Carl Hasty, executive director of the Tahoe Transportation District. “I am confident we can do it. I don’t see any physical impediment and (trails) are very popular.

“They have become an important part of the Tahoe experience.”

The Incline-to-Sand-Harbor path follows construction of a 2.3-mile stretch of trail on the South Shore between Edgewood Tahoe Golf Course and Round Hill Pines, finished in 2015. Both are demonstration projects designed to show

how the Stateline to Stateline project, which would extend more than 30 miles in all, can be built over the coming years.

Nevada State Route 28 along Lake Tahoe’s East Shore between Spooner Summit and Incline Village has long been a place with significant traffic, parking, and safety problems.

Beautiful beaches, coves and trails are a major attractant for throngs of visitors, but off-highway parking options are limited. Many folks visiting the East Shore park on the highway shoulder, with well over 1,000 cars parked bumper to bumper at times.

The situation poses a major safety hazard, with many accidents and injuries occurring over the years.

“There was major concern for the safety of all roadway users,” said Morgan Beryl, senior transportation planner for the Tahoe Regional Planning Agency. “In some cases driving was your only option. There was basically no access for bicycles and pedestrians except for the roadway itself.”

The Incline to Sand Harbor trail

project is designed to address the situation there and show how it can be successfully accomplished elsewhere as well.

“The 3 miles kind of typifies the solutions that are necessary,” Hasty said. “It’s the first 3 miles of what will be 11 miles that stretch all the way to Spooner. We’re really learning from those first 3 miles.”

Solving the problems along Highway 28 requires a broad partnership. Participants include the transportation district and TRPA, the Nevada Department of Transportation, Nevada Division of State Lands, U.S. Forest Service, Nevada State Parks, and Tahoe’s three Nevada-side counties – Washoe, Carson City, and Douglas.

“It’s a cross-jurisdictional solution. We all work together and we get better solutions that way,” Hasty said. “It also makes it easier to get it on the ground and paid for.”

Continued on page 25

Forest project

Continued from page 7

a collaboration involving the Forest Service, National Forest Foundation, TRPA, California Tahoe Conservancy, California State Parks, and private landowners including Homewood Mountain Ski Resort.

That project targets some 60,000 acres in the Tahoe Basin west of the lake but also looks at points farther west, including portions of Eldorado and Tahoe national forests and Granite Chief Wilderness. The idea of such “large landscape initiatives” is to sideline jurisdictional boundaries and look at changes that benefit the forested terrain as a whole, giving careful consideration to various issues, including air and water quality, wildlife habitat, recreation, and others.

“It’s helping us develop a strategy,” Garrett said. “We’re really looking at the whole landscape.”

“This is part of a larger vision. This isn’t just happening at Tahoe, it’s happening all across the Sierra,” said TRPA’s Restaino, who is currently working to amend the agency’s “environmental threshold” for vegetation.

Environmental thresholds are long-term environmental goals for the Tahoe Basin. The purpose of the Environmental Improvement Program is to attain those thresholds. Most of the thresholds were established in 1982 and are in need of an update.

The primary goal of the existing vegetation threshold is to preserve native vegetation. That preservation might not be realistic considering the impacts of climate change, which stands to drastically alter what forests of the future look like.

“We were working under the assumption we would always have forests (similar to those today),” Restaino said. “The risk of fire and drought and insect outbreaks make that assumption weak.”

With an estimated 156 million trees now dead across the Sierra due to drought, the fact that forest conditions are changing is obvious, Restaino said.

For that reason, an amended vegetation threshold will focus more on forest resilience, or the capacity of the landscape to withstand and recover from the impacts of drought and large wildfires. Experts can then gauge if EIP projects align with forest resiliency goals.

Fibs, fakes, and falsehoods

The truth about Tahoe is often much different from the myths we hear

David C. Antonucci

SPECIAL TO TAHOE IN DEPTH

Beginning with tall tales told around ancient campfires to today's internet, Lake Tahoe has been the subject of myths, legends, and misquoted facts and stories.

As a way of setting the record straight — how can you protect a lake shrouded in so much mystery? — I'll be using science, logic, history, and other investigative methods to debunk some of these myths. There are a lot of them, so look for additional articles in future issues of Tahoe In Depth.

The name "Tahoe" means...

The list of erroneous explanations for the meaning of "Tahoe" is lengthy and includes such fabrications as big water, high water, deep water, and grasshopper soup among many others. Of course, none are historically accurate.

Tahoe comes from the anglicized mispronunciation of the Washoe Native American phrase for the lake, *da ow a ga*. Roughly translated, it means the "edge of the lake" where generations of Washoe camped during their summer excursions to the lake.

Bancroft Company mapmaker William Henry Knight appropriated the first two syllables of the phrase, which he thought rhymed with Washoe, to replace the official name, Lake Bigler. John Bigler was the third governor of California, and the legislature rewarded him for leading a party to rescue trapped pioneers at the lake by naming the lake in his honor.

However, Bigler was suspected of organizing support for the Confederacy, incensing many westerners and motivating Knight to make the switch. For the first time, Bancroft's 1862 Map of the Pacific States unofficially labeled the water body as Lake Tahoe. Although the name Tahoe stuck through the late 19th and early 20th centuries, the official title as Lake Bigler lingered until 1945 when the California Legislature finally relented and agreed to change the name to Lake Tahoe.

The Lake Tahoe shoreline length is ...

No other Tahoe fact has been so misquoted than the correct length of its shoreline. If one does a Google search, the results will yield 25,000 or more sites where the Tahoe shoreline length is cited as 72 miles.

While the length of the roadway

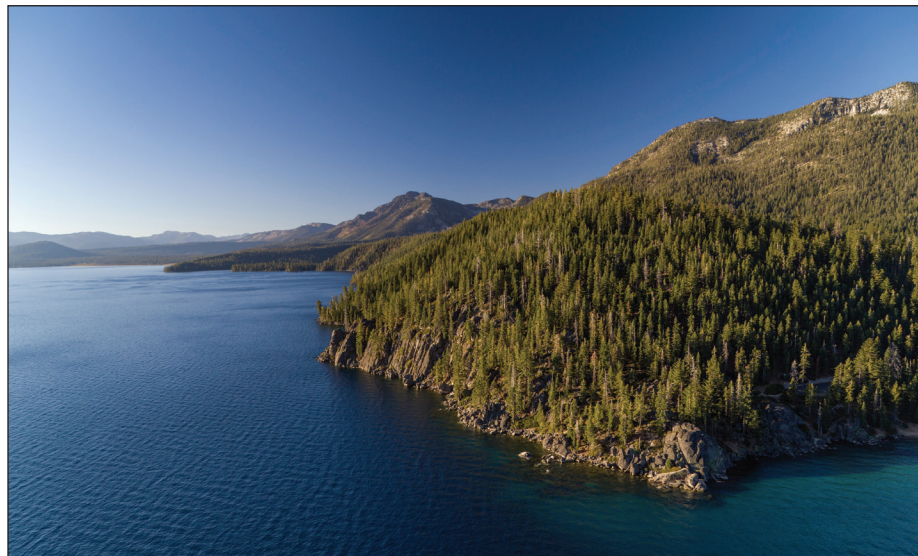
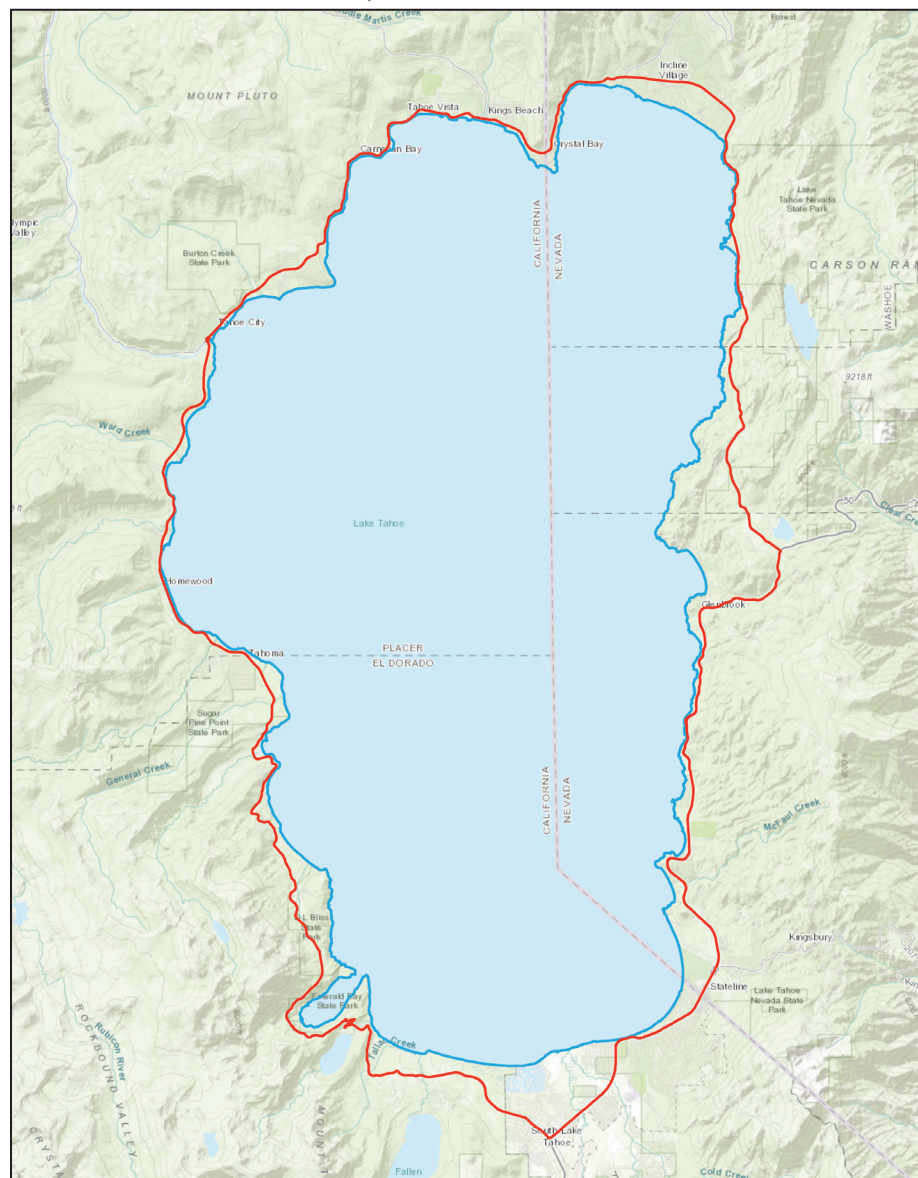


Photo: Drone Promotions

The Tahoe shoreline does not vary significantly when the water surface elevation changes because much of the nearshore is steep.



The length of the shoreline around Lake Tahoe (blue line) is approximately 75 miles while the length of the road around the lake (red line) is approximately 72 miles.

encircling Lake Tahoe is approximately 72 miles, the actual measured length of shoreline is 75.1 miles at an average water elevation of 6226.1 feet.

The confusion began with a Tahoe Tavern advertisement for the route of its steamship SS Tahoe. The ad said the route was 72 miles long, and somehow this got interpreted as not the route of the steamer but the length of the shoreline. The earliest mention in print of a 72-mile shoreline appears in a 1904 travel guide. From there, it was repeated many times until it became widely accepted as the truth.

However, the encircling highway is 71.8 miles long. How do we fit a 75.1-mile lake inside a 71.8-mile road? Simple: Lake Tahoe has peninsulas that jut out across the water while the corresponding road shortcuts across the point. For example, Stateline Point has 1.9 miles of shoreline, but the road only covers 0.9 miles over the same segment.

Some might wonder how Lake Tahoe's shoreline can remain consistent in length when the elevation of the water surface can fluctuate by more than 6 feet. It does not vary significantly with depth because so much of the nearshore is steep or even vertical. The water surface area varies by less than 1 percent between low water and high water, causing only a minuscule change in length.

Tahoe is 99.7 percent pure

You have read it many times in Lake Tahoe promotional literature that the purity of Lake Tahoe water is 99.7 percent. If this were true, Lake Tahoe would be a puddle of muddy soup.

Why? Because 99.7 percent water content means there are 3,000 parts of solid matter per million parts of water. For comparison, the sewage that flows in Tahoe sewers is typically 99.9 percent pure water.

The actual measure of the dissolved matter in Lake Tahoe water is 99.994 percent, meaning it contains only 60 parts per million of dissolved solids, making it one of the purest large lakes in the world. Only commercially distilled water is purer at 99.999 percent or 10 parts per million.

David C. Antonucci is a civil and environmental engineer and 43-year resident of Lake Tahoe. He is currently writing a book on the natural history and natural science of Lake Tahoe. In future articles in this series, he will debunk the myths about a prehistoric monster swimming the depths of Tahoe, the fate of drowning victims, and whether Jacques Cousteau ever took a deep dive into Lake Tahoe.

SKI OR RIDE FOR FREE



Purchase a CA or NV Tahoe license plate and get **one free Alpine or Nordic ticket** to the Tahoe resort of your choice*. Now you can play in some deep powder without having to dig deep to make a difference. Your modest commitment will help fund hiking and biking paths, and water quality and restoration projects in the Lake Tahoe Basin. For more information or to purchase your license plate online, visit TAHOEPLATES.COM.

**ELYSE SAUGSTAD
& CODY TOWNSEND**
Professional Freeride Skiers

*restrictions apply

Design underway for 8-mile trail proposed between Sand Harbor and Spooner Summit

Continued from page 23

Private entities have stepped to the plate as well. The Tahoe Fund, a nonprofit organization established to raise private money for environmental improvement projects, has raised more than \$1 million for the Incline-to-Sand-Harbor project. That money will assist not only with construction but for long-term maintenance of the trail.

“This is much more than the most beautiful path in the country, it is a wonderful example of what can be accomplished when everyone works together,” said Tahoe Fund CEO Amy Berry. “We are grateful to all of the public agencies who worked tirelessly for decades to build this dream path and to the private community of donors who stepped up to help make it happen.”

The new trail sets an example of the kind of improvements that have been “a long time coming,” said Elizabeth Kingsland, Tahoe program manager for the Nevada Division of State Lands. The division is charged with the task of implementing Nevada’s share of the Environmental Improvement Program.

“This is one of the critical pieces and is in a very difficult section (of highway) to implement,” Kingsland said. “I think a lot of people are going to be very excited to get on that trail.”

To get cars off the highway shoulder, existing off-highway parking would be expanded and new parking

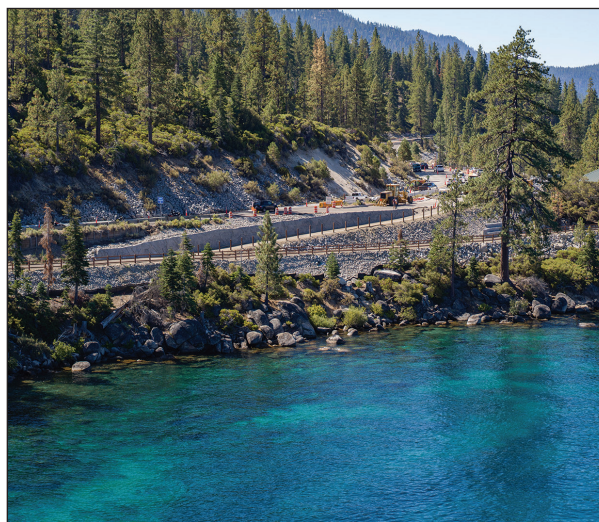


Photo: Drone Promotions

A view of the Sand Harbor bike trail construction from the water.

lots built. Parking in the off-highway lots — now free — would have to be paid for. That would raise money for trail maintenance and at the same time hopefully encourage increased use of public transit to access the area. Parking along the highway, once options are available, could result in a costly citation.

Folks will soon be using the new trail between Incline

and Sand Harbor and progress is also being made for other sections of the Stateline to Stateline project.

Design and environmental analysis are underway for the 8-mile stretch of trail proposed between Sand Harbor and Spooner Summit, including the expansion of two existing Forest Service parking lots, construction of another at Secret Harbor and expansion of seasonal transit to better serve the area.

The Tahoe Transportation District has meanwhile applied for funding to plan the next portion of shared-use trail to the south parallel to U.S. 50 — 1.5 miles linking Round Hill Pines to Zephyr Cove.

“That would allow us to get the south Stateline area connected to all those public beaches. That would be a great step,” Hasty said.

Gavin Feiger, president of the Lake Tahoe Bicycle Coalition, said he’s “super excited” about the new trail now being finished near Sand Harbor. He said it serves as a prime example of what should be established all around the lake, both to ease congestion and benefit the environment.

“A lot of people showing up in cars has a much bigger impact than people showing up on bikes,” Feiger said. “Tahoe’s such a beautiful place but it’s not the most enjoyable place to do long-distance cycling right now.

“There’s a huge demand for this,” Feiger said.

Become a Tahoe In Depth subscriber or supporter

We hope you've enjoyed this edition of *Tahoe In Depth*. **You can help keep the paper coming!** Consider becoming a subscriber to *Tahoe In Depth* so that you and others can continue to receive ideas on "Protecting, Enjoying & Exploring the Lake Tahoe Basin" in your mailbox.

All subscribers are entered in a drawing to win a \$100 gift certificate from a local nursery for a native tree. Just cut out and mail in the subscriber form and your check made out to the Tahoe Regional Planning Agency or subscribe online at tahoeinddepth.org.

And please send us your feedback or story requests to tahoeinddepth@gmail.com — we love to hear from our readers.

YES! I want to become a subscriber to *Tahoe In Depth* and continue "Protecting, Enjoying & Exploring the Lake Tahoe Basin." Please find enclosed my check for

Subscriber Levels:

☐ \$1 - \$99

Friend

☐ \$100 - \$249

Supporter

☐ \$250 - \$499

Benefactor

☐ \$500 - \$999

Advocate

☐ \$1,000 - \$2,499

Champion

☐ \$2,500 and up

Philanthropist

Name:

Address:

City:

State:

Zip:

Phone:

Email:

Mail to: Tahoe In Depth, PO Box 5310,

Stateline, NV 89449

Enter our drawing!

For every issue of Tahoe In Depth, all subscribers are entered to win a \$100 gift certificate from a local nursery for a native tree.

This issue's winner

Congratulations to:
\$100 gift certificate winner: Rick Verbanec, Pebble Beach, CA

Thank You

Tahoe In Depth is made possible by the generous support of subscribers and underwriters. From the entire team at *Tahoe In Depth*, thank you for contributing to the publication.



What readers are saying:

"Thank you for publishing a very informative paper. My brother and I are older and have been coming to Tahoe since 1950, the paper keeps us current on what's happening in Tahoe."

— D.M. .



TAHOE IN DEPTH

Protecting, Enjoying & Exploring the Lake Tahoe Basin

Save time, save paper: *Subscribe online at tahoeinddepth.org*

Readers who have subscribed to Tahoe In Depth since our last issue:

- | | | | | |
|---------------------------|-----------------------|---------------------------|---------------------|------------------|
| John Ciatti | Janet Tashima | Nancy Lang | Brad Marsh | Steve Sparks |
| Douglas Ryder | David Deboskey | R D Verbanec | Mike Correia | Mark Dunbar |
| Susan De Vincenzie | Catherine Whelan | Douglas Swager | David Sliper | Walter Schneider |
| Laurie and Stephen Malley | Irene Gonzalez | Richard H Clark | Nancy Kilborn | John S Lien |
| Nora Jansen | Irene & Gary Lavaysse | Michael and Cathie Tritel | John & Anne McHenry | Del Laine |
| Gayle Bowers | Barb and Jim Berner | Jane Newhard-Parks | Gerhard Parker | Thomas Schaefer |
| Geoff Wilson | Joseph Gibson | Leslie Ward | Margaret Tracey | Leona Knowlton |



So glad you're here! Here are eight insider tips to help you do everything you want to do in Tahoe:

1. DRINK TAHOE TAP™

No need to buy bottled water. Tahoe Tap is the world's best. Literally. We win awards. Fill and refill your reusable bottles all day.

2. BE #1 AT PICKING UP #2

If it's your dog, then it's your doody. If left behind, your cute pet's waste drains into the lake and grows horrible monsters.

3. NO ONE WANTS TO SEE YOUR DIRTY BUTT

Cigarettes leach toxic chemicals into Tahoe. Please keep your butts from touching the ground.

4. TRASH BELONGS IN THE CAN

What happens in Tahoe shouldn't stay in Tahoe. Wherever you are, trash or recycling cans are never far.

5. YOU GONNA EAT THAT?

Human food hurts wildlife. Protect our wild animals by locking trash in bear-proof bins.

6. BROKEN SLEDS NEED HOMES TOO

Awesome sledding is part of the Tahoe landscape, but the sleds aren't. Remember to take your sleds home, even if they are broken.

7. LEAVE ONLY TRACKS

Fields of fresh snow give us smiles for miles. Blaze a trail of kindness with other snowshoers and skiers.

8. TAKE IT TO THE TOP

Lift rides are more fun when you hop off with everything you had when you got on, like gloves, parents, and litter.

takecaretahoe.org #takecaretahoe



TAHOE
REGIONAL
PLANNING
AGENCY

Take
care.

Up from the ashes of Angora

Fallen Leaf/Angora Ridge Trail a welcome improvement to area devastated by 2007 fire

By Jeff DeLong

SPECIAL TO TAHOE IN DEPTH

At the place where Lake Tahoe's largest wildfire charred forest and homes alike, folks have taken the opportunity to make something positive rise from disaster.

Last summer, mountain bikers from Lake Tahoe and across the country took advantage of a new single-track trail system linking neighborhoods in Lake Valley to the towering top of Angora Ridge.

The Fallen Leaf/Angora Ridge Trail Project, completed last year at a cost of \$60,000, is a welcome addition to an area still recovering from the impacts of the Angora Fire of 2007.

"I think it's a really good story," said Ben Fish, president of the Tahoe Area Mountain Bike Association (TAMBA), which played a central role in making the project a reality.

"We came together to create a positive change to an area that was just devastated," Fish said.

Sparked June 24, 2007 by an illegal campfire, the wind-driven Angora Fire blasted through 3,100 acres of tinder dry forest in the North Upper Truckee area just outside South Lake Tahoe, destroying 254 homes in a matter of hours.

It was what the fire experts had long feared at Lake Tahoe, producing damaging impacts still felt to this day.

In the wake of the fire, ambitious work to restore a charred landscape was quickly undertaken by the U.S. Forest Service and other agencies.

EIP projects focused largely on forest and watershed restoration. Hazardous trees were removed from hundreds of acres, while thinning of overstocked stands of timber to improve forest health and reduce future fire danger occurred across another 1,200 acres.

New trees, composed of a mix of aspen, red fir, sugar pine, and incense cedar, were planted on more than 500 acres of forest and 220 acres of urban lots with the idea of establishing a more healthy and diverse forest landscape than existed before the fire.

While forest and watershed restoration may have been a top priority in the wake of the blaze, it was not the only one.

The burn area had long been popular to bikers and hikers and experts began planning how to improve recreational



Photo: Anthony Cupaiuolo

A mountain biker makes his way along the new Fallen Leaf/Angora Ridge Trail, completed last year at a cost of \$60,000.

opportunities there.

"We consider multiple things when we look at an area that has burned and recreation is one of them," said Mike Gabor, forest engineer for the Lake Tahoe Basin Management Unit.

"The local residents were strongly interested in having a trail network," Gabor said. "Putting trails back was a no-brainer."

So planning began for construction of the Fallen Leaf/Angora Ridge Trail Project as a means to help the agency meet its environmental goals in the areas of recreation and scenic resources.

Plans and designs were completed but there was still one problem.

"There was no money to actually build the trail. That's where TAMBA stepped in," Fish said.

Through fundraising events and private donations, TAMBA was able to

raise some \$60,000 toward the Angora trail project. The money was able to fund construction of 5 miles of trail over the summer of 2017 – the Angora Ridge Trail, extending some 3 miles across the top of Angora Ridge, and the Mule Deer Trail, a 2-mile stretch linking the ridge to the neighborhoods to the east.

Initial grading work was conducted by the Forest Service but the two trails were completed by hands-on volunteer efforts. TAMBA hosted some 60 volunteer trail days, with about 150 volunteers working more than 2,000 hours to get the trails completed in October 2017.

Offering stunning views of Fallen Leaf Lake, Mount Tallac, and a sprawling forested landscape, the trails are "really popular," Fish said. "They've been getting a lot of buzz."

If the Forest Service had to do the entire project on its own, it would still

probably have been built but not for several more years, Gabor said.

"If it was our priority and not theirs it wouldn't have happened so quickly," Gabor said. "You just can't beat the enthusiasm of the people that are going to actually use these trails."

TAMBA and the Forest Service aren't stopping there.

Supporters hope to begin building another 2 miles of single-track trail linking Angora Ridge to Lily Lake, Fish said. Beyond that, they hope to build a trail along the West Shore of Fallen Leaf Lake and ultimately, around Cascade Lake to Emerald Bay.

Such improvements, Gabor said, come with benefits to both recreation and the environment.

"It's all part of trying to get cars off the road and connecting the community to their public lands," Gabor said.