

# The Lake Tahoe Basin Management Unit

Ecological Restoration is the central driver of wildland and forest stewardship in the Lake Tahoe Basin Management Unit (LTBMU), across all program areas and activities. Our Land and Resource Management Plan, watershed assessments, and individual project plans identify Ecological Restoration as a core objective. The Ecological Restoration work we do is accomplished through an “all lands” approach, in which we play a major role in supporting restoration and conservation of wildlands and forests throughout the Basin, regardless of ownership. We approach each project with an “all resources” multi-user ethic that considers the many different needs of the land at each location. Further, we consider the long-term changes that may occur in climate and how those may affect ecosystem services<sup>4</sup> upon which Basin residents and visitors depend. This way of doing business is the culmination of decades of ongoing coordination and collaboration with Basin stakeholders, agencies, and the public, within the Basin’s Environmental Improvement Program (EIP).<sup>5</sup> The EIP has consistently focused on returning the famed clarity of the water of Lake Tahoe to historical levels through addressing the many contributing causes of its loss, including the poor watershed conditions that have resulted from lack of fire and general choking of stream zones with excessive vegetation.

The 63 streams in the Basin that feed Lake Tahoe flow freely across land ownerships and governmental jurisdictions of all kinds, so coordination and collaboration are essential to gaining economies of scale and to minimizing redundancy; the collective recognition of this being the EIP. In 1969, Congress’ ratification of a bi-state compact between California and Nevada authorized the formation of the Tahoe Regional Planning Agency (TRPA) and gave it authority to impose protective land use ordinances

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4. “Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling. (See Figure A.) The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ecosystem services.” Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Synthesis. Available at [www.millenniumassessment.org/documents/document.356.aspx.pdf](http://www.millenniumassessment.org/documents/document.356.aspx.pdf)

5. The history of the EIP is succinctly captured in A Federal Vision for the Environmental Improvement Program at Lake Tahoe (TRPA; June, 2006), which can be found at: [www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsm9\\_046280.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_046280.pdf) )

Basin-wide. Only a few years later, in 1973, the Forest Service created the LTBMU to better serve the Basin communities. TRPA created a Regional Plan, in which it established Environmental Thresholds Carrying Capacities (“Thresholds”). The EIP is the framework within which TRPA organizes the efforts of the Basin’s many stakeholders and agencies to meet these Thresholds. Our unwavering support for the EIP has expanded and developed partnerships within the Basin that have given us increased organizational capacity and flexibility. We have been able to quickly shift the mix of contracted, in-house, and volunteer labor needed to most effectively collaborate with city, county, state, federal, and private partners and the public, on projects large and small. Key categories of activities in which we engage our partners and the public include monitoring resource conditions, managing and restoring or enhancing terrestrial and aquatic ecosystems, and regulating human uses.

Among the specific activities we coordinate and/or accomplish collaboratively are:

- installing Best Management Practices (BMPs) to minimize erosion and consequent sediment input to Lake Tahoe,
- “greening” facilities and improving our transportation energy footprint,
- forest thinning and prescribed fire to decrease fuel loading, increase forest heterogeneity and improve forest habitat for wildlife,
- implementing environmentally and ecologically sensitive uses of prescribed fire, including restoring fire-adapted character to meadows,
- meadow and riparian restorations to improve watershed function, species habitat and diversity,
- eradication of weeds and invasive plant species,
- protection measures, conservation strategies, and recovery actions for Threatened and Endangered species,
- prevention and control of aquatic invasive species infestations, and
- adaptive management, where the collaborative development and implementation of projects is strongly integrated with science.

Many of these activities are integrated into individual projects, as most projects have multiple objectives. Not

all of the projects fly under the banner of ecological restoration, however. Ecological restoration objectives are accomplished routinely in the Basin by a wide variety of activities and programs that do not fit the traditional view that only stream and meadow restoration work is ecological restoration. For example, all of our fuels reduction projects are attentive to reaching desired conditions for habitat improvement; we know overgrown fuel-laden forests support a much lower diversity of wildlife. Likewise, we've greatly minimized sediment loading to Lake Tahoe by decommissioning poorly-maintained roads and trails, installing BMPs and changing pavement designs at facilities and campgrounds, and passing through substantial funding to other jurisdictions for urban erosion control projects. And our routine review of requests to renew or expand special use permits for commercial permittees and recreational cabins have afforded opportunities to conduct detailed analyses of the potential impacts to flowing springs, ground-water dependent ecosystems, and riparian zones; we modified the permits where needed to strengthen environmental protections. Careful attention to opportunities for prevention helps us avoid the need for more ecological restoration in future years.

We track and annually seek to improve our efforts to make our facilities and activities more energy efficient and sustainable. Our recent "greening" accomplishments include major renovation of the Meyers Work Center buildings, where more than 100 employees report for duty every day of the field season, which put those buildings well on the way to earning LEED Certification. We have a proactive Green Team on the Unit, a journeyman-level ecologist enthusiastically serving as our Climate Change Coordinator, frequent webinars on climate change that are attended by staff from various departments, forward-looking narrative within our draft revised forest plan (Final Plan is due December 2012), and specific climate change assessments already done in some projects (e.g., Incline Fuels Project and Meeks Bay BMP Project). We are keenly aware that, in California, water will be the most pivotal resource affected by climate change.

In honoring our agency ethic "Caring for the Land and Serving People" we follow the corporate concept of the triple bottom line: we see sustainable solutions only at the intersection of the economic, social, and environmental needs. We believe that our role in shaping and implementing the EIP has provided us the best opportunities to reach sustainable solutions to the Basin's many challenges.

We have been mindful of the need for science to inform management, too. Approximately \$30 million

has been allocated to science projects from federal funding in the Basin since 2005. Our strong participation in the Basin's Science Management Integration Team, its annual Relevancy Reviews of science proposals, and numerous working groups and committees, is partly a result of our need to work with nearly 100 funded science projects to date; we issue dozens of research permits annually. Research on ecosystem services in the Basin is focused on valuing ecosystem services, measuring and monitoring ecosystem service indicators, and mapping changes in supply across a landscape. Research scientists are also studying key drivers of ecosystem change and the loss of ecosystem services, including climate change, droughts and floods, habitat loss, recreational opportunity spectrum losses, fire and forest health issues, invasive species, and land use change resulting in loss of open space. Our own specialists are highly educated, experienced scientists who frequently contribute to science in the Basin. More than 20 of our employees participated in the Tahoe Science Conference held May 2012, and several also gave presentations and/or moderated sessions; the conference focus was on environmental challenges in a changing climate and LTBMU was a major sponsor, along with TRPA, the USGS, the EPA, and various Basin agencies and stakeholders.

Five Years from now, we expect to have implemented nearly all of the projects for which we currently have secured funding under the Southern Nevada Public Lands Management Act (SNPLMA), which have a present value of nearly \$130 million. These include:

- Angora Creek Channel and Gardner Mountain Meadow Restoration (\$2.87 million)
- Aspen Communities Restoration (\$1.6 million)
- Big Meadow Watershed Fire Regime Restoration (\$1.6 million)
- Blackwood Creek Phase 3B Stream Restoration (\$1.95 million)
- Camp Richardson Resort Campground & Vehicle Circulation BMP Retrofit (\$3 million)
- Carnellian Hazardous Fuels Reduction and Healthy Forest Restoration (\$10.1 million)
- Erosion Control Grants Program (\$30 million)
- Fallen Leaf ATM (\$0.5 million)
- Fire-Adapted Meadows Restorations (\$1.59 million)
- High Meadows / Cold Creek Restoration (\$2.77 million)

- Incline Hazardous Fuels Reduction and Healthy Forest Restoration (\$8.84 million)
- Incline Lake Dam Restoration (\$5.5 million)
- Meeks Meadow Restoration (\$2.1 million)
- South Shore Ecosystem Restoration Fuels Reduction (\$27 million)
- Spooner Hazardous Fuels Reduction and Healthy Forest Restoration (\$6 million)
- Tallac Historic Sites BMP Retrofit (\$0.75 million)
- Upper Truckee River Reaches 5 and 6 Restoration (\$12.5 million)
- West Shore WUI Fuels Reduction and Ecosystem Restoration (\$10.8 million)

The majority of these funds will flow through the local economy using local contractors, supporting sustainable operations, and providing world-class recreational experiences.

Most of the projects scheduled to be implemented in the Basin during the next five years focus on the two priority watersheds (the Upper Truckee River watershed and the Ward Range watershed that includes both Ward Creek and Blackwood Creek) that we identified in our initial Action Plan for the Watershed Condition Framework. Many projects will be implemented elsewhere in the Basin, in part due to the need to treat excessive fuel loadings in the Wildland Urban Interface (WUI, shown on Map 1, page 63).

Vegetation treatments to improve forest health also occur Basin-wide annually and are coordinated with our fuels reduction projects. In FY12, the combined fuels target for LTBMU was 1,262 acres, evenly split between 631 acres specifically for fuels reduction and 631 acres of forest health improvement thinning (Timber Stand Improvement). We integrate these two programmatic functions under a single contract to reduce the overall cost of completing these treatments, which would be greater if done separately. In addition to accomplishing fuels reduction goals, these projects also contribute substantially to aspen stand restoration, wildlife habitat improvement, restoring meadow/riparian function, and improving water quality.

Recent Accomplishments that illustrate our “all lands” and “all resources” approaches include ongoing work on the Angora Fire Burn Area, the Meyers Landfill, and High Meadows:

**Angora Fire Burn Area** contains intermingled private, city, county, state, and federal lands (Photo 1), and our restoration planning benefitted where multi-jurisdictional coordination was possible. We have enlisted the help of the community in planting thousands of trees (Photo 2). The vegetation and fuels treatments are on track to be completed this year and the 100% design for the stream channel restoration has been received.

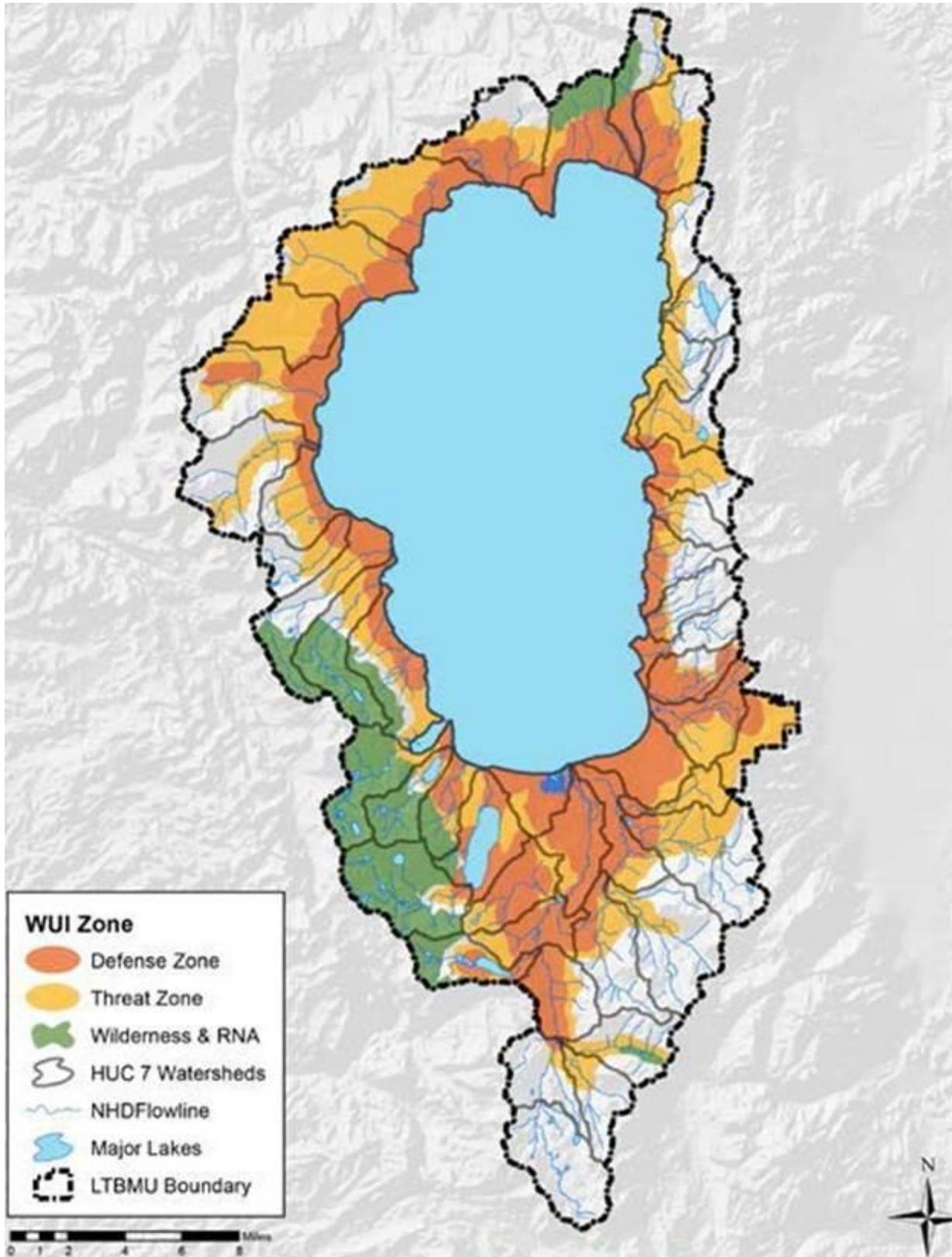


Photo 1: One of the 254 homes lost in the Angora Fire.



Photo 2: LTBMU hydrologist Stephanie Heller speaks to the hydrologic and vegetation response within the burn area one year after the fire.

### WILDLAND URBAN INTERFACE IN THE LAKE TAHOE BASIN



**Meyers County Landfill Remedial Action** (Photo 3) included closing and removing onsite trails and roads, felling trees from bordering areas, and installing drainage systems; then capping the landfill with protective materials and top-dressing it with vegetated soil that closely matches natural soil and vegetation (Photo 4). Assuming reasonable evidence of established vegetation this fall, recreational use of the area will be allowed to return. Aquatic Organism Passage concerns in adjoining Saxon Creek are being addressed, too.

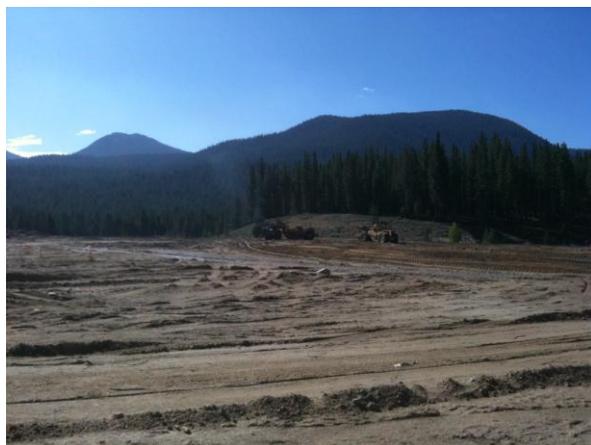


Photo 3:(Top) Initial removal of the vegetation and topsoil overlying the buried waste in Meyers Landfill began in 2010. (Bottom): Abandoned automobiles were found in the trees bordering the landfill and removed.

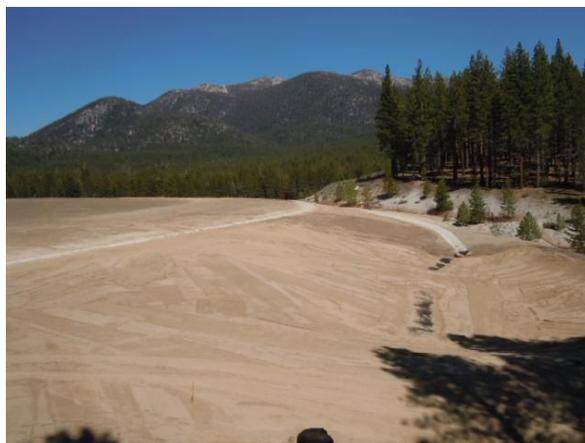


Photo 4: The last steps of the Meyers landfill restoration prepare the surface soils for seeding.

**High Meadows / Cold Creek Restoration** includes major improvements made to the access road (3 miles), re-routing of popular trails (3 miles), filling of deeply incised stream channels (1/2 mile) and replacement with properly shaped stream channels (1 mile; Photos 5 and 6), thinning of conifers from the meadow and adjacent stands (300 acres), and burning the meadow (200 acres).



Photo 5: Cutting a new stream channel for Cold Creek in High Meadows.



Photo 6: Irrigating the new channel for the North Fork of Cold Creek to help fully re-establish meadow vegetation.

Many Opportunities for ecological restoration within the LTBMU are NEPA-ready and partially funded by SNPLMA, with which we intend to leverage requests for the additional funding needed in each case, including:

- Aspen Communities (thin conifers from aspen stands, underburn to improve vigor)
- Big Meadow (thinning & Rx pile burns, meadow burns, trail work)
- Fire-Adapted Meadows (thinning & Rx pile burns, meadow burns, trail work)
- Lahontan Cutthroat Trout (LCT habitat removal of nonnative fish)

- LEED Certification of Meyers Work Center retrofit (certification)
- Meeks Meadow (thinning & Rx pile burns, meadow burns, trail work)
- Tahoe Yellow Cress development of updated Conservation Strategy (TES action)
- Upper Truckee River (reshaping channel and floodplains; 1.2 miles)

As the Basin transitions over the next five years away from SNPLMA, we will be leveraging the appropriated funds received with that of partnership and grant opportunities (such as for Native Fisheries & Bring Back the Natives). We will continue to initiate and implement ecological restoration activities and projects on invasive species (aquatic and terrestrial plants), continue recovery actions on Lahontan cutthroat trout and soon to be listed species like Sierra Nevada (mountain) yellow-legged frog and Tahoe yellow-cress. We'll continue to emphasize projects with multiple program area and target completion (for stream miles improved, lake acres enhanced, terrestrial habitat enhanced, and invasive species treatments from projects). In addition, we will continue to coordinate with adjacent forests in seeking Collaborative Landscape Restoration Funds (CLRF). All of these support the leadership intent on ecological restoration expressed previously by Region 5.