

GREATER UPPER TRUCKEE

WATERSHED RESTORATION



ACCOMPLISHMENTS AND OPPORTUNITIES

MARCH 2022



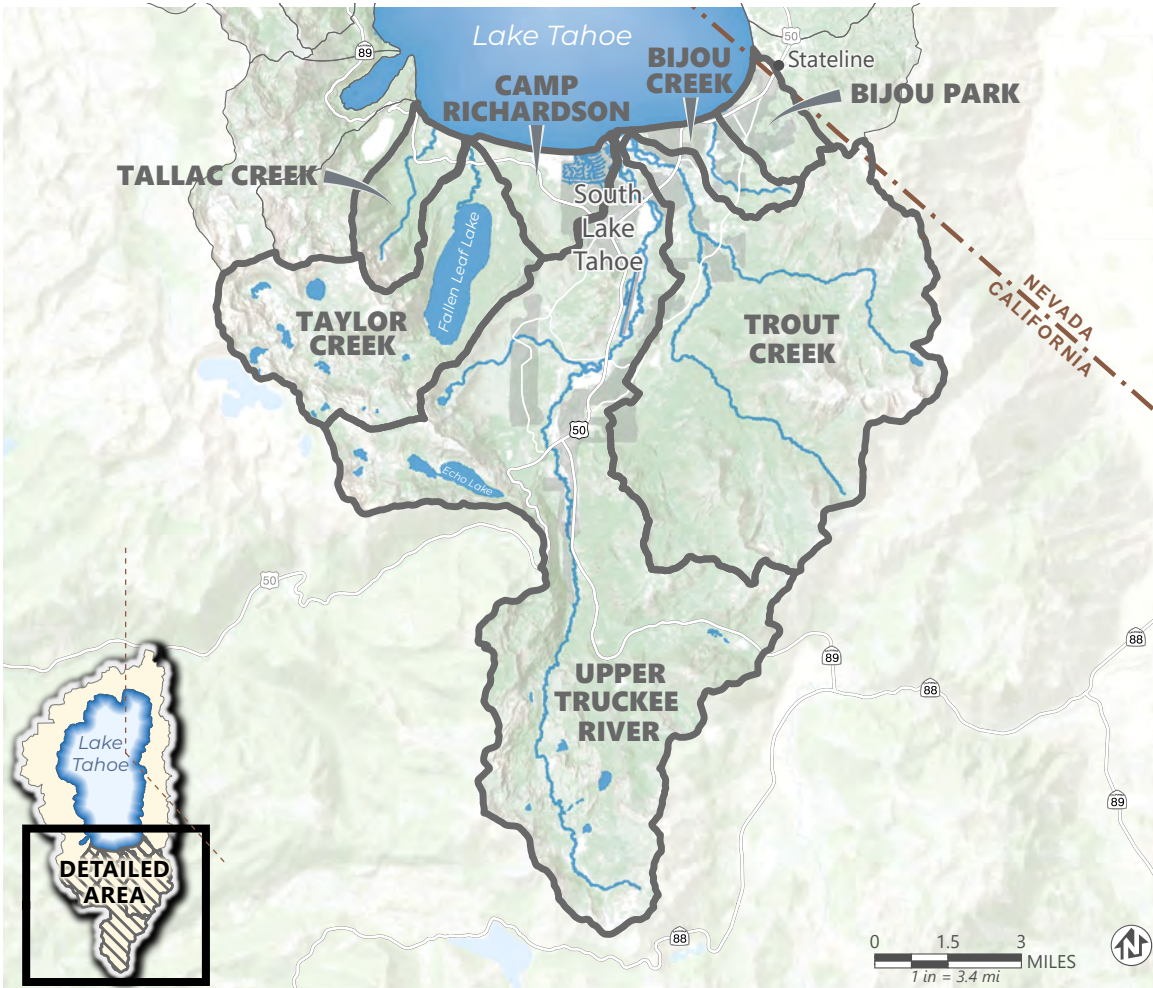
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CONTENTS

The Importance of the Greater Upper Truckee Watershed	5
Historical Watershed Changes	7
Watershed Challenges	8
Increasing Climate Impacts	9
A History of Watershed Partnerships	10
Opportunities to Build on Accomplishments	12

Restoring the greater Upper Truckee watershed is critical to ensuring the resilience of our community and environment in the Lake Tahoe Basin and beyond. Climate driven threats—including catastrophic wildfires, record-breaking heatwaves, severe droughts, and devastating floods—are increasingly part of our daily lives. Protecting and restoring natural watersheds is one of the greatest opportunities to adapt to climate change, especially at Lake Tahoe.

The 2021 Caldor Fire threatened to destroy Tahoe communities and impacted the greater watershed’s streams, meadows, and forests. This recent climate driven incident emphasizes the urgency and importance of watershed restoration. Partners in the Lake Tahoe Basin have the opportunity to make things better. There is no time to waste.



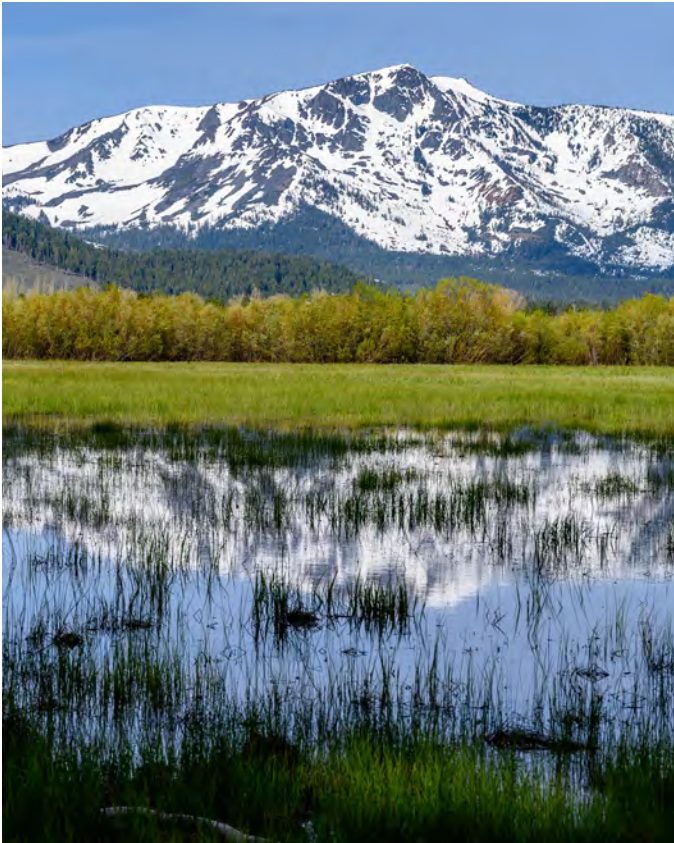
The **geographic scope** of the greater Upper Truckee watershed includes the entire south shore of the Lake Tahoe Basin within California. It includes the Upper Truckee River, Trout Creek, and Taylor Creek watersheds, and smaller adjacent watersheds.

THE IMPORTANCE OF THE GREATER UPPER TRUCKEE WATERSHED

The Upper Truckee River is the largest tributary to Lake Tahoe, draining approximately one third of the Lake Tahoe Basin (Basin) land area. The greater Upper Truckee watershed includes upland forests, tributaries, and meadows that provide important wildlife habitat, ecosystem diversity, and climate resilience. The watershed is also home to the City of South Lake Tahoe and the Basin’s largest residential population.

Resource management agencies at Tahoe have long targeted this landscape for restoration. Federal, tribal, state, regional, and local partners are investing in projects to address decades of disturbance and development. Efforts to thin forests, control erosion, restore rivers, and treat storm water have dramatically improved environmental conditions.

With strategic investment, resource managers can **improve the climate resilience** of this special place, **restore areas impacted by the Caldor fire**, and **enhance community wellbeing**. Working in **partnership**, agencies can restore the habitat, water quality, and natural floodplain functions of the Upper Truckee River and other streams. Partners need to thin more forested areas to **reduce the risk of additional wildfire** and improve watershed health. Additional projects will help **reduce pollution** from developed areas, and new bike paths and other improvements can **enhance equitable public access** and connect Tahoe neighborhoods and communities.



Upper Truckee Marsh and Mt. Tallac / California Tahoe Conservancy

Tahoe partners have identified **ten key opportunities*** for restoring the greater Upper Truckee watershed. This includes projects to restore the Upper Truckee River and Trout Creek corridors, for which \$50 million is needed.

*see page 13 for more detail.

RESTORATION BENEFITS

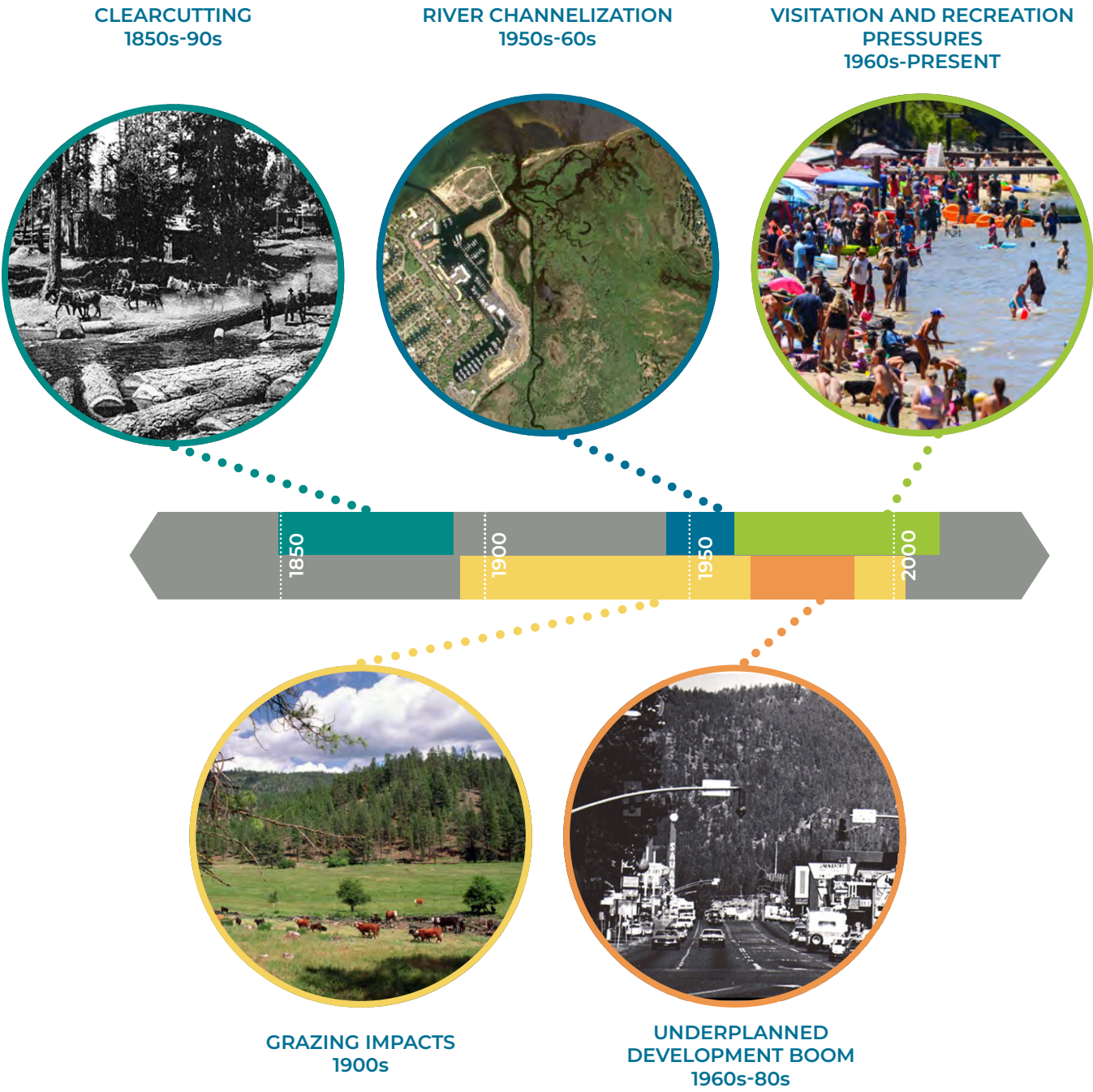
- Enhanced meadow systems that capture more carbon;
- Reduced wildfire risk by thinning unnaturally dense forests;
- Restored wetlands that naturally filter pollutants to protect Lake Tahoe’s clarity;
- Increased groundwater storage;
- Wetter ecosystems that improve habitat for native, sensitive, and endangered species; and
- Expanded equitable access to outdoor recreation opportunities.



Clockwise from upper left: Upper Truckee River Restoration / Nick Spannagel, Reducing hazardous fuels in South Lake Tahoe / California Tahoe Conservancy, Upper Truckee Marsh wildlife / Gavin Furman, Cycling at the Upper Truckee Marsh / California Tahoe Conservancy, Meadow below the 2007 Angora Fire / Nick Spannagel, Crystal clear Lake Tahoe / California Tahoe Conservancy.

HISTORICAL WATERSHED CHANGES

For millennia, the Washoe People have stewarded the lands surrounding Lake Tahoe to protect and maintain habitat for culturally significant plants and animals. In the last 200 years, Euro-American settlers have negatively impacted the streams, forests, and meadows through logging, grazing, fire suppression, and extensive urbanization and development. The Basin is increasingly at risk from extreme wildfire, flooding, and drought—all driven by the changing climate.



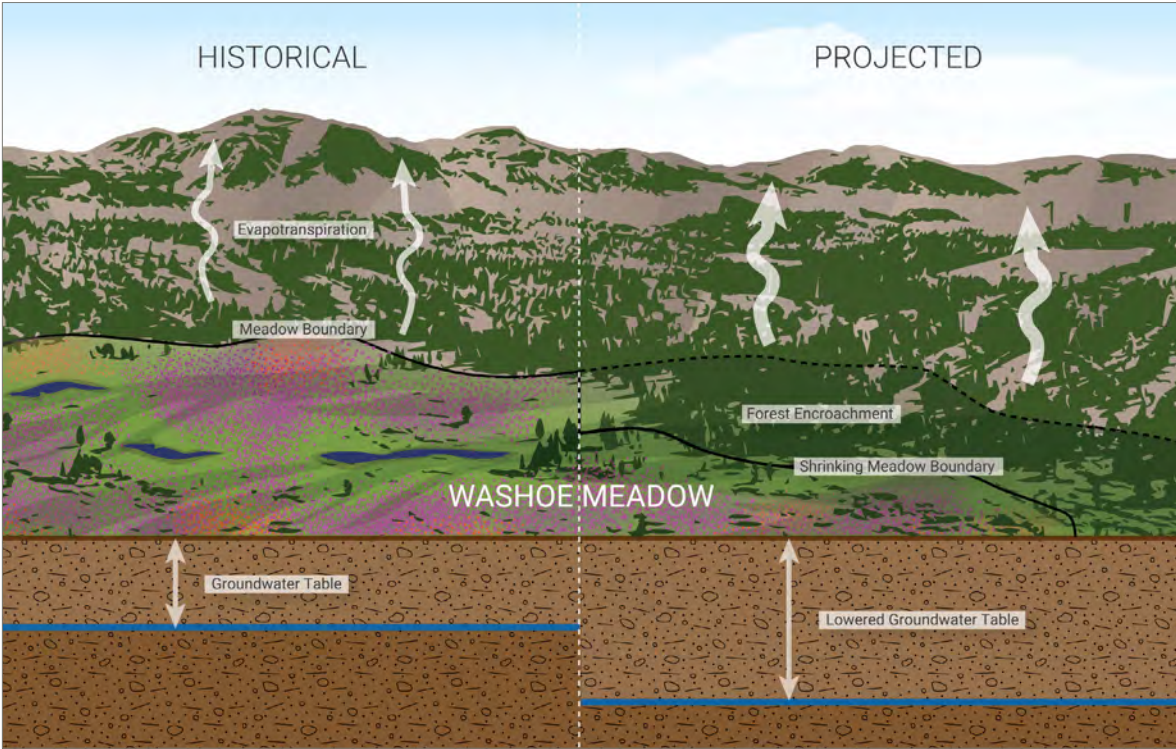
WATERSHED CHALLENGES

Rivers have lost their natural functions

Altered stream channels have lower groundwater levels, drier meadows, more channel erosion, and prevent sediment-laden flood flows from being filtered across the river floodplain.

Meadows are drying and have lost habitat

Development has eliminated over half of the meadows and riparian areas that provide critical wildlife habitat in the greater Upper Truckee watershed.



Changing climate conditions are driving meadow habitat loss. Changes in temperature and the timing of peak stream runoff will impact the structure and function of river and meadow ecosystems. Conifers will encroach upon and reduce meadow habitat as groundwater tables lower.

Forests are overly dense and at risk of catastrophic fire

Today's forests are dense, even-aged, and continuous, lacking small openings and patches of lower tree density that would provide diverse wildlife habitat and slow the spread of fire.

Lake clarity has diminished

Roads, buildings, and parking lots concentrate water runoff into strong flows that carry fine sediment and nutrients into streams and Lake Tahoe.

Transportation systems and recreation sites struggle with demand

Overcrowding in peak recreational seasons is causing heavy traffic and congestion, degrading natural areas, and diminishing resident quality of life and visitor experience.

INCREASING CLIMATE IMPACTS

The greater Upper Truckee watershed is highly vulnerable to climate change impacts, from the health of its streams, meadows, and forests, to South Lake Tahoe's communities and recreation-based economy. Without restoration, **many meadows will dry up** and lose the ability to capture and store carbon. As evidenced by the Caldor Fire, **larger and more intense wildfires** require communities to adapt to increasing risks of fire and **unhealthy air quality** caused by smoke. As summers warm across the west, visitation to key trailheads and shoreline locations is expected to continue to increase, while **lower lake levels** caused by extended droughts will impact boating, beaches, and water sports. Extreme weather, wildfire, and other hazards damage highways and will create **more frequent outages for water, energy, and communication utilities**.



Firefighters battle the Caldor Fire in the Desolation Wilderness / inciweb.nwcg.gov

Climate change now affects everything in the Basin. Future impacts expected by the year 2100 include:

- Average **temperatures will increase by 4 to 9°F**, making summer in Tahoe feel as hot as summer in San Jose does today.
- Rising temperatures will increase the elevation at which snow accumulates, decrease the size of the snowpack, and **shorten the length of the winter recreation season by half**.
- **Peak stream runoff will occur five months earlier** in the year, happening in January instead of June.
- The amount of **rainfall from the largest storms will increase by up to 30 percent**, causing more flooding to communities.
- **Wildfires will be larger and more frequent**. Without intervention, the total area burned each decade is projected to be **61 percent larger** than in 2000.

A HISTORY OF WATERSHED PARTNERSHIPS

Partners have been working together to restore the greater Upper Truckee watershed for decades. The Lake Tahoe Environmental Improvement Program (EIP), a partnership of federal, state, and local agencies, private interests, and the Washoe Tribe of Nevada and California (Washoe Tribe), was established in 1997 to achieve the environmental goals of the Basin. For more information on the EIP and projects visit eip.laketahoeinfo.org.

Since 2007, EIP partners have invested approximately \$232 million in 105 collaborative, multiple-benefit projects in the greater Upper Truckee watershed.



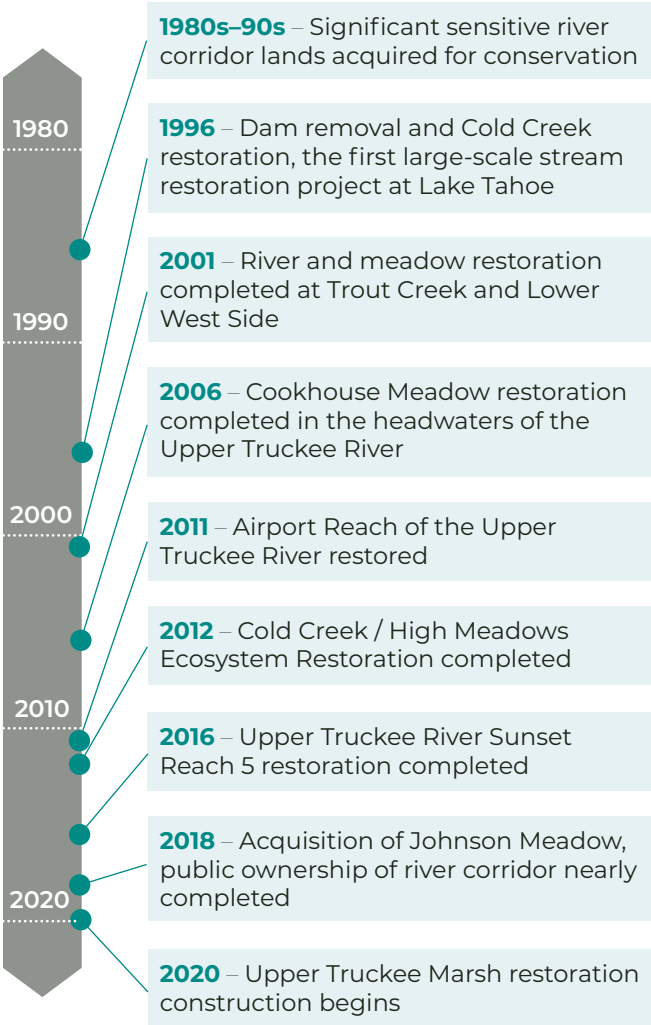
RIVER AND MEADOW RESTORATION

In the greater Upper Truckee watershed, EIP partners have **completed 15 projects to restore streams, rivers, wetlands, floodplains, and enhance wildlife habitat** for special status species. Stream and meadow restoration activities have included restoring, revegetating, and connecting stream channels and floodplains, removing grazing permits, acquiring sensitive properties, and removing buildings, asphalt, and fill.



Beginning in 2013, the USDA Forest Service constructed a new channel and recontoured the floodplain to allow spring flows of the Upper Truckee River to spill over its banks and saturate the meadow once again. / Tahoe Regional Planning Agency

RIVER AND MEADOW RESTORATION MILESTONES



FOREST HEALTH

Since 2010, EIP partners have **completed over 30 forest health and hazardous fuels reduction projects** treating 17,870 acres to reduce wildfire threat and improve forest resilience.



California Conservation Corpsmember reducing hazardous fuels on a California Tahoe Conservancy property in South Lake Tahoe / California Tahoe Conservancy

LAKE CLARITY

EIP partners have **completed 35 storm water projects to protect lake clarity** within the greater Upper Truckee watershed in the last ten years, filtering urban runoff, recharging local groundwater supplies, and enhancing watershed resilience.



Bijou Park Creek Basin captures storm water from the surrounding developed area / California Tahoe Conservancy

TRANSPORTATION AND SUSTAINABLE RECREATION



Since targeted project tracking began in 2010, EIP partners have **completed 25 projects to enhance public access to the Lake**, including accessible multi-use paths and expanded trail networks to reduce traffic and carbon emissions.

Bike routes provide transportation options / Tahoe Regional Planning Agency

OPPORTUNITIES TO BUILD ON ACCOMPLISHMENTS

BUILDING LANDSCAPE RESILIENCE

The health of the greater Upper Truckee watershed's forest, meadows, streams, wildlife, and communities are all interconnected.

The Tahoe-Central Sierra Initiative's **Framework for Resilience** offers ten pillars of landscape resilience that reflect the interdependent nature of social and ecological values.



The ten pillars of resilience represent desired landscape outcomes / Tahoe-Central Sierra Initiative

ENHANCING RESILIENCE IN THE GREATER UPPER TRUCKEE WATERSHED

Ongoing restoration of the greater Upper Truckee watershed is critical for advancing these resource management objectives.

Restore climate resilience
Prioritizing multiple-benefit projects that address the environmental and social effects of climate change will help communities adapt to future climate conditions.

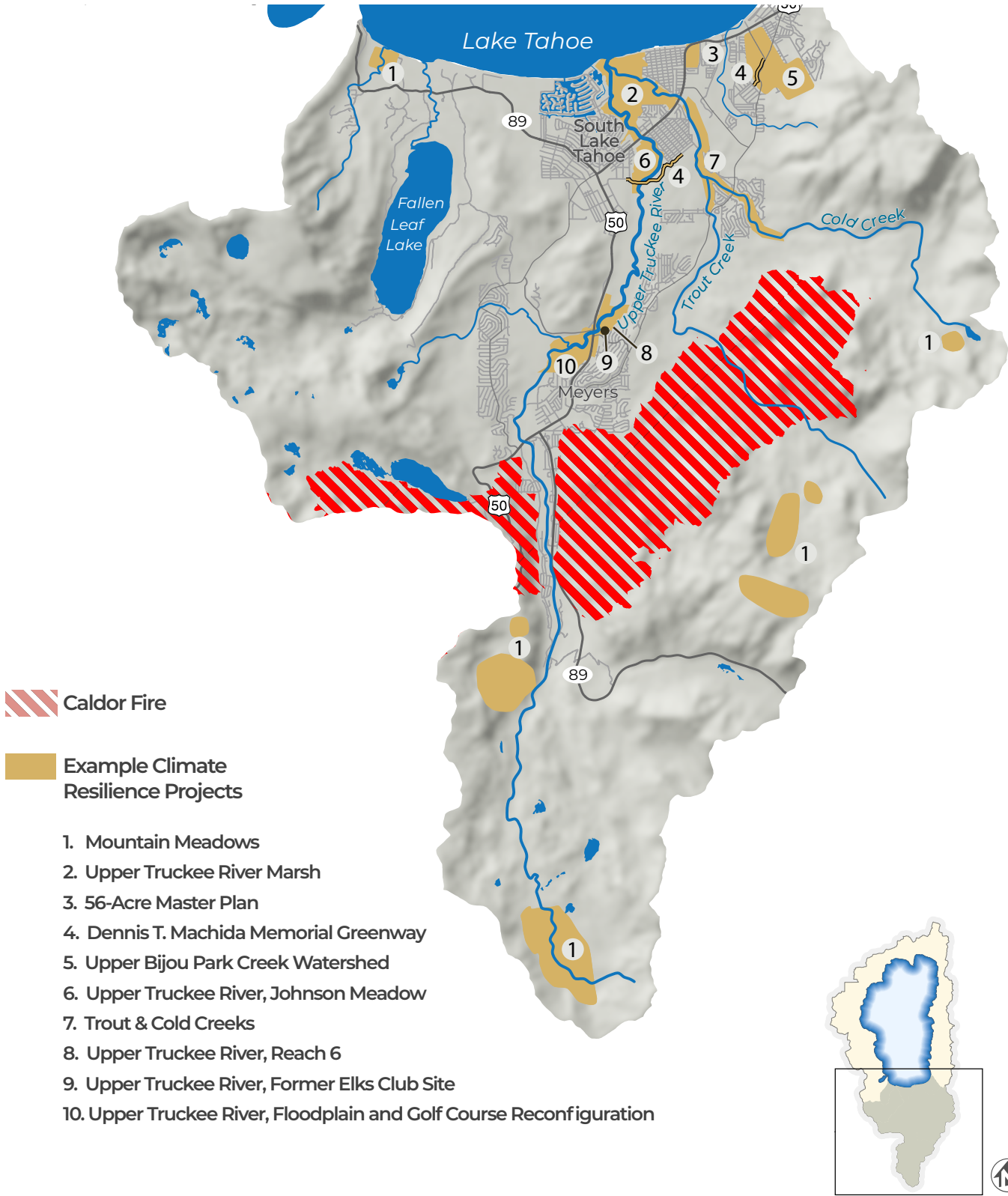
Acquire and preserve sensitive lands
Continuing targeted land conservation, including several important remaining sensitive land acquisitions, will further protect key watersheds.

Integrate community wellbeing and stewardship in restoration
Educating residents and visitors about restoration benefits, engaging them in stewardship, and increasing recreational opportunities for all is fundamental to effective watershed restoration.

Enhance collaboration with the Washoe Tribe
Expanding collaboration with the Washoe Tribe to include co-management and knowledge exchange, enhancing the connections between the land and the communities that depend on its health.

ACTION NEEDED TO ADDRESS CLIMATE CHANGE

Partners are working at the landscape scale to implement integrated, multiple-benefit projects that increase climate resilience. **These ten opportunities** are some of the important remaining needs.



Caldor Fire

Example Climate Resilience Projects

- 1. Mountain Meadows
- 2. Upper Truckee River Marsh
- 3. 56-Acre Master Plan
- 4. Dennis T. Machida Memorial Greenway
- 5. Upper Bijou Park Creek Watershed
- 6. Upper Truckee River, Johnson Meadow
- 7. Trout & Cold Creeks
- 8. Upper Truckee River, Reach 6
- 9. Upper Truckee River, Former Elks Club Site
- 10. Upper Truckee River, Floodplain and Golf Course Reconfiguration

Integrated watershed projects provide multiple benefits

Targeted projects improve forest resilience to wildfire and drought, enhance lake clarity, protect drinking water resources, safeguard native species habitat, and reduce the threat of aquatic invasive species. Restoration within the river corridors provides wildlife habitat, biodiversity, and recreation and scenic quality benefits. Completing connections for people biking, walking, and riding transit also improves the outdoor experiences for visitors and residents while protecting natural resources.

Caldor Fire Forest and Watershed Restoration Activities

Priority project implementation will help heal the landscape and Basin communities affected by the fire.

1. Mountain Meadows

The USDA Forest Service, Lake Tahoe Basin Management Unit plans to restore meadows by removing conifers and conducting prescribed burning.



Baldwin Meadow in November 2018 after meadow burn / USDA Forest Service, Lake Tahoe Basin Management Unit

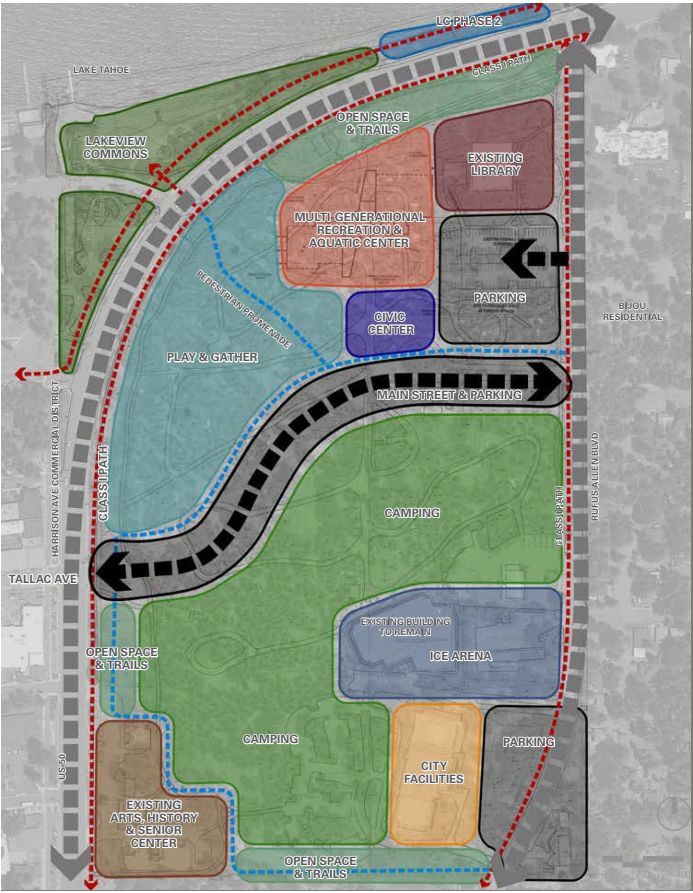
2. Upper Truckee River Marsh – Future Work

The California Tahoe Conservancy (Conservancy) will continue marsh restoration to build upon and strengthen the already completed stream and wetland restoration and public access improvements.

3. 56-Acre Master Plan

The City of South Lake Tahoe is developing a master plan, which will provide a

comprehensive strategy for the project site. Site improvements will advance recreation and access to the greater Upper Truckee watershed by providing facilities and services that are responsive to the community's recreational and health needs.



Preferred Concept Program Diagram / 56 Acres Master Plan

4. Dennis T. Machida Memorial Greenway Shared Use Trail

The Conservancy and El Dorado County are advancing the next sections of this priority trail network to add approximately two miles of shared use path and re-establish a bridge to facilitate key travel ways.



Shared use trails are popular amenities / California Tahoe Conservancy

5. Upper Bijou Park Creek Watershed

This project will manage runoff from urban areas and roadways to reduce loading of fine sediment particles and nutrients and alleviate flooding in the Bijou Park Creek watershed.



2017 flooding of Bill Avenue in the Bijou Park Creek watershed / City of South Lake Tahoe

6. Upper Truckee River, Johnson Meadow

Acquired by Tahoe Resource Conservation District (Tahoe RCD) in April 2018, Johnson Meadow is an approximately 200-acre property located within the highly developed urban corridor. Tahoe RCD is engaged in a comprehensive phased restoration project.



The Upper Truckee River has a deep gully channel within Johnson Meadow / Tahoe Resource Conservation District

7. Trout & Cold Creeks – Future Work

The Conservancy and partners have identified several sections of Trout and Cold Creeks that need restoration, adaptive management, and vegetation management. The Conservancy will soon initiate planning activities to address these issues and strategize for comprehensive restoration in these critical tributaries.

8. Upper Truckee River, Reach 6

The Conservancy and partners will restore the river channel and floodplain and remove encroaching conifers to reclaim the meadow and reduce wildfire risk.



The Upper Truckee River has no buffer from the golf course, causing bank erosion and sediment input / California Department of Parks and Recreation

9. Upper Truckee River, Former Elks Club Site

El Dorado County will continue to restore and improve this previously developed site to provide habitat, water quality, and recreation improvements.

10. Upper Truckee River, Floodplain and Golf Course Reconfiguration

The California Department of Parks and Recreation is working to restore natural processes to the Upper Truckee River by improving connectivity between the river and floodplain and realigning the golf course near Washoe Meadows State Park.



Conifer trees have encroached on the floodplain of Reach 6 of the Upper Truckee River, disrupting important meadow habitat / California Tahoe Conservancy

Lake Tahoe Basin residents and visitors are already experiencing climate change impacts. Comprehensive, landscape-scale restoration efforts offer the most cost effective and durable opportunities to provide environmental resilience and adapt to climate-driven threats.

At Lake Tahoe, restoring the greater Upper Truckee watershed provides a unique opportunity to protect the regional community and environment. The climate crisis is here. There is no time to waste.



The California Tahoe Conservancy would like to thank the numerous federal, local and community partners who provided valuable feedback in developing this document. The significant contributions of the following organizations are particularly appreciated:

California Department of Parks and Recreation
City of South Lake Tahoe
El Dorado County
Tahoe Regional Planning Agency
Tahoe Resource Conservation District
Tahoe Science Advisory Council
USDA Forest Service, Lake Tahoe Basin Management Unit