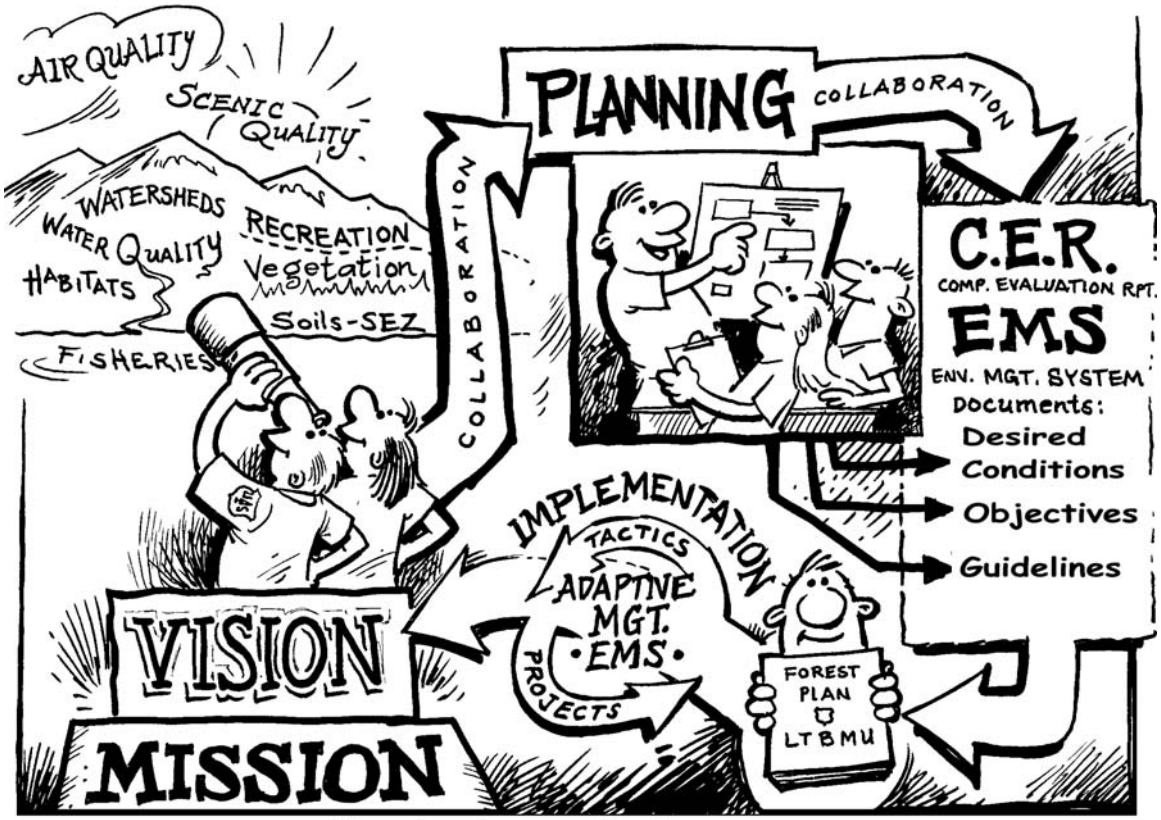
Introduction

What is a Comprehensive Evaluation Report?

A Comprehensive Evaluation Report (CER) evaluates current conditions and trends in the Forest Plan area that contribute to social, economic, and ecologic sustainability. A CER also evaluates the management direction – are the desired conditions, objectives, and guidelines still appropriate? Using this information, the CER then identifies needed changes to the Forest Plan that will better facilitate achieving the revised desired conditions, goals, and objectives.

This evaluation covers the time period from the implementation of the 1988 Lake Tahoe Basin Management Unit Land and Resource Plan (Forest Plan) to the present. Future Comprehensive Evaluation Reports will be produced every five years, as required by the 2005 National Forest System planning regulations (36 CFR Part 219).



Planning is a cyclical process

For some resource and program areas, conditions, trends, and need for change have been described in Pathway 2007 documents. The Pathway 2007 project is a collaborative effort to align the long-term planning documents for the Forest Service, the Tahoe Regional Planning Agency (TRPA), the Lahontan Regional Water Quality Control Board, and the Nevada Department of Environmental Protection (NDEP) into a set of cohesive, mutually-supported planning instruments, while fostering interagency trust and understanding. This Comprehensive Evaluation summarizes conditions and trends; more detailed information on resource conditions and trends may be found in the Pathway Evaluation Report and Technical Supplement and in Forest Service monitoring reports.

Document Organization

The first part of Chapter 1 describes legal requirements and policy the Forest Service must consider in writing or revising a Forest Plan, along with national, regional, and local planning efforts that will be considered in plan revision. The second part of Chapter 1 describes the social, economic, and ecologic environments of the Lake Tahoe Basin.

Chapter 2 summarizes the need for change, and delineates the scope of the Lake Tahoe Basin Management Unit (LTBMU) Forest Plan revision. The scope is described in terms of the major plan revision themes, which reflect public comment and participation in the planning process:

- Ecosystem Restoration
  - Restoring degraded watersheds
  - Reducing hazardous fuels and restoring forest health
- Recreation Management
- Land Use – Suitability of Areas
- Planning and Adaptive Management

Chapter 3 consists mainly of condition and trend reports for the resource and program areas in the current LTBMU Forest Plan. These reports describe how well the LTBMU has achieved the Forest Plan goals, and what needs to be changed in the Forest Plan. This chapter also identifies other potential changes in program and resource areas that will facilitate meeting Forest Plan goals.

Chapter 1: Background and Scope of Forest Plan Revision

What is a Forest Plan?

The "Forest Plan" or Land and Resource Management Plan, is the principal document that guides the decision making of forest managers. Forest Plans identify where and under what conditions an activity or project can proceed. Each time a project or activity is proposed, we must ensure that it is consistent with the Plan. Forest Plans are strategic in nature, and do not make decisions about specific projects; they provide long-range management direction such as desired conditions and objectives, the kinds of uses that are suitable for various areas of the Forest, the management guidelines that apply to different kinds of activities, and the designation of special areas like Research Natural Areas. Forest Plans provide guidance and boundaries for management decisions, and serve as our contract with the public for management of public lands.

The goals of land management planning outlined in 36 CFR 219.1(b) are to:

1. Sustain the multiple uses of its renewable resources in perpetuity while maintaining the long-term productivity of the land consistent with the Multiple-Use Sustained-Yield Act of 1960

2. Focus on maintaining or restoring the health of the land in order to provide a sustainable flow of uses, benefits, products, services, and visitor opportunities

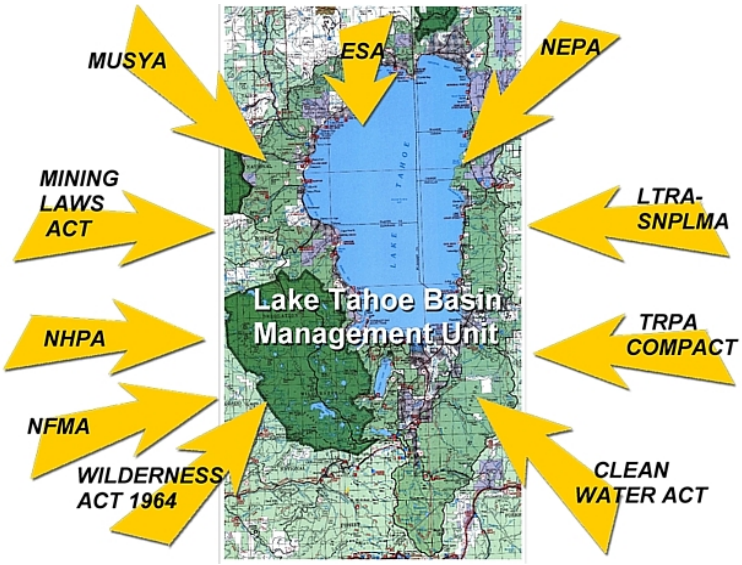
Laws, Regulations, and Policy that Affect Forest Planning

The Responsible Official (the Forest Supervisor of the Lake Tahoe Basin Management Unit) will determine whether the revised plan is consistent with current laws, regulations and policies. In addition to following the National Forest Management Act and the National Environmental Policy Act (NEPA), plans must include desired conditions, objectives, strategies, and design criteria that are consistent with other laws, including but not limited to, the Multiple-Use Sustained-Yield Act, the Endangered Species Act, the Clean Water Act, the Clean Air Act, the Mining Law of 1872, the National Wilderness Preservation System Act, the National Historic Preservation Act. A more detailed description of each of these laws and regulations can be found at: http://www.fs.fed.us/biology/planning/guide/laws.

Additional laws and regulations including the Lake Tahoe Restoration Act (LTRA), the Southern Nevada Public Lands Management Act (SNPLMA), and the TRPA Compact are described in the Pathway 2007 Technical Supplement (http://www.pathway2007.org).

Figure 1. Laws Regulations and Policy that affect Forest Planning

Numerous federal laws regulate, guide, and influence forest planning for the Lake Tahoe Basin Management Unit.



Writing and Revising Forest Plans

The legal requirements for developing, revising, and amending Forest Plans are found in the Code of Federal Regulations at 36 CFR Part 219. This direction is commonly referred to as the "planning rule" or the "planning regulations." The current Forest Plan was developed under the planning regulations completed in 1982.

The new planning rule adopted on January 5, 2005, takes forest planning in the direction of strategic planning. While forest plans have always been strategic in nature, plans developed under the new rule will not make proposals for major Federal actions affecting the human environment with effects that can be meaningfully evaluated. This means that an Environmental Impact Statement (EIS) will not be required for most Forest Plans, and Forest Plans will be categorically excluded from the NEPA process. A Forest may choose to make decisions in the Forest Plan that require environmental analysis; in that case, an EIS would be required.

The National Forest Management Act (NFMA) of 1976 requires national forests to develop forest plans and to update or revise them every 15 years or when conditions significantly change. Forest Plans may be revised to take advantage of new science and monitoring, changing laws, policies and direction, and changing trends and uses in a world of constant change. Under the new planning rule, forest plans will still be revised every 15 years, but they will also be reviewed every five years, and plan amendments will be made based on needs for change identified in the review process. Both the 5-year review process and the 15-year revision process require a Comprehensive Evaluation Report. This approach will enable adaptive management to keep pace with rapidly advancing scientific understanding and findings, and with rapid change in how forest lands and resources are used and valued.

Forest Service Manual and Handbook

The Forest Service Manual and Handbook directives system provides a substantial amount of the "how to" direction of forest management, including forest planning. The Manual contains legal authorities, objectives, policies, responsibilities, instructions, and guidance. Handbooks provide specialized guidance and instruction for carrying out the direction issued in the Forest Service

Manual (FSM). Specialists and technicians are the primary audience of Forest Service Handbook (FSH) direction. The Revised Forest Plan will be developed consistent with current directives. The directives can be viewed at http://www.fs.fed.us/im/directives/.

Related National Planning Efforts

National planning efforts are in progress for a number of land management issues that concern all National Forests to varying degrees. In revising the Forest Plan, the planning team must consider how these plans and associated programs fit into the Lake Tahoe Basin land management strategy.

USDA Forest Service Strategic Plan

The USDA Forest Service Strategic Plan for Fiscal Years 2004-2008 (USDA 2004) was prepared to provide the context and purpose for agency actions under the Government Performance and Results Act (Public Law 103-62). The strategic plan is intended to be the keystone of the Forest Service management and establishes goals, outcomes, performance measures, and strategies that apply to management of the national forest lands as well as other Forest Service mission areas.

- Reduce the risk from catastrophic wildland fire: Restore the health of the nation's forests and grasslands to increase resilience to the effects of wildland fire.
- Reduce the impacts from invasive species: Restore the health of the nation's forests and grasslands to be resilient to the effects of invasive insects, pathogens, plants, and pests.
- Provide outdoor recreation opportunities: Provide high-quality outdoor recreational opportunities on forests and grasslands, while sustaining natural resources, to meet the nation's recreation demands.
- Help meet energy resource needs: Contribute to meeting the nation's need for energy.
- Improve watershed condition: Increase the number of forest and grassland watersheds that are in fully functional hydrologic condition.
- Mission-related work in addition to that which supports the agency goals: Conduct research and other mission-related work to fulfill statutory stewardship and assistance requirements.

For the LTBMU, other mission-related work includes:

- Fire prevention and suppression
- Maintenance and improvement of wildlife and fisheries habitats
- Protection of sensitive, threatened, and endangered plant and animal species
- Collaboration with the Washoe tribe
- Protection of historic sites
- Resource inventory, monitoring, and analysis to support adaptive management
- Land acquisition
- A wide array of planning and administrative tasks
- Contributions to local economic and social sustainability

LTBMU's accomplishments are fully described in the resource discussions in Chapter 2.

Four Threats

In April 2003, Chief of the Forest Service Dale Bosworth identified Four Threats to the Health of the Nation's Forests and Grasslands. They have provided a national perspective and raised public awareness about issues common to National Forest system lands across the country. While these issues vary in importance in different National Forests across the nation, they are land management planning considerations for all Forests.

Fire and Fuels: High fuel accumulations due to overly dense forest stands have increased the risk of large, high-intensity wildfires. Increased population growth at forest edges has increased the risk to neighborhoods.

Invasive Species: Weeds, insects, and disease-causing organisms threaten the ecological integrity of many forested areas.

Loss of Open Space: Privately owned forests and rangelands are being developed at a rapid rate. The loss of this open space reduces wildlife habitat and eliminates corridors that connect habitats, which can lead to local extinction and reduced breeding success.

Unmanaged Recreation: Nationwide, motorized off-highway vehicle (OHV) use has increased from approximately 5 million in 1972 to 36 million in 2000, making it necessary to restrict OHV use to designated routes to prevent severe environmental degradation.

Roadless Area Conservation Rule

In the fall of 1999, the Forest Service began developing a plan for identifying and managing roadless areas. Following extensive public comment and release of a Draft and Final Environmental Impact Statement, a Roadless Area Conservation Rule was issued in January 2001. However, in July 2003, the Wyoming District Court issued a nationwide permanent injunction against the Roadless Area Conservation Rule.

On May 5, 2005, the Forest Service adopted the State Petitions Rule that allows state governors the opportunity to seek establishment of management requirements for Inventoried Roadless Areas (IRAs) on national forest lands within their states. If a state petition and subsequent rule is not adopted, roadless areas will continue to be evaluated through the forest plan revision process. IRAs are those identified in the Roadless Area Conservation FEIS, Volume 2 (USDA 2000b). In addition, the Forest Service announced that it is reinstating the interim protection measures for inventoried roadless areas that expired in June 2003 (69 FR 42648, July 16, 2004). Final decision on the Roadless rule may affect future wilderness designations.

California submitted a petition to retain protection for all IRAs on July 12, 2006. Nevada is in the process of preparing its petition.

On September 19, 2006, a US District Court in San Francisco overturned the 2005 Roadless Rule, and reinstated the 2001 rule. Currently, the Forest Service is reviewing the implications of the policy and in the interim is maintaining the petition process.

LTBMU has 46,000 acres of Inventoried Roadless Areas, plus an additional 24,000 acres of designated Wilderness (Figure 2).

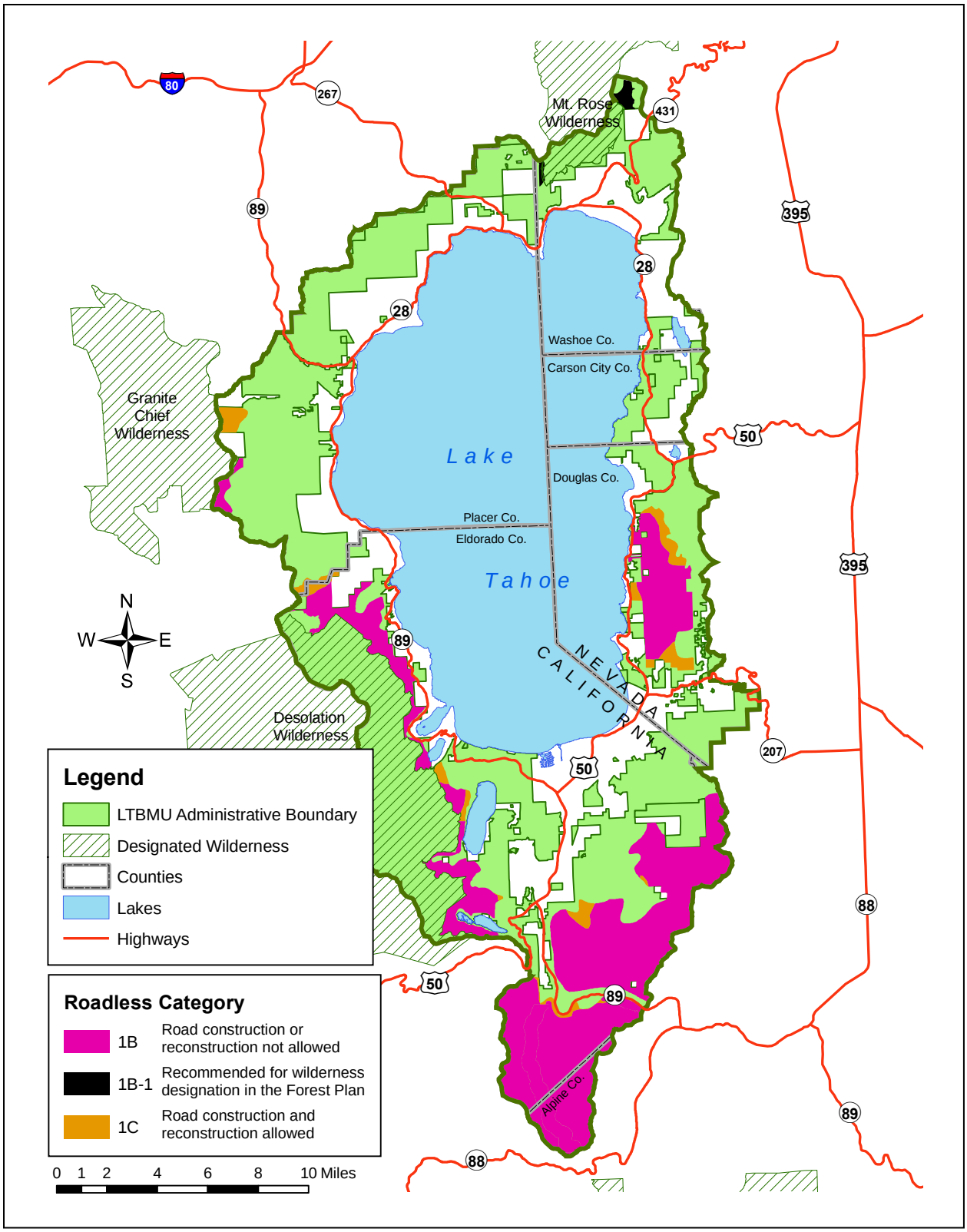


Figure 2. Inventoried Roadless Areas on the Lake Tahoe Basin Management Unit

Federal Wildland Fire Management Policy and National Fire Plan

In the aftermath of the wildfires that occurred throughout the nation in 2000, the Federal Wildland Fire Management Policy (USDA/USDI 1995) was reviewed in response to a request from the Secretaries of the Interior and Agriculture. The findings of the review concluded that the 1995 policy was generally sound and appropriate, although conditions of the fire-adapted ecosystems were worse and more complex than previously understood. Changes were identified to improve program management, implementation, oversight, leadership, and evaluation to implement the policy. The Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy (USDA/USDI 2003b) primarily adopted guiding principles, policy statements, and implementation actions. The policy is focused on internal federal agency strategic direction for a broad range of fire management related actions.

Healthy Forest Restoration Act of 2003 and Community Wildfire Protection

In December of 2003, the Healthy Forests Restoration Act (HFRA) was passed into law. The HFRA identifies six specific objectives:

- Reduce wildfire risk to communities, municipal water supplies, and some at-risk federal lands through a collaborative process of planning, prioritizing, and implementing projects.
- Authorize grant programs to improve the commercial value of forest biomass for electric energy, useful heat, transportation fuels, and petroleum-based product substitutes.
- Enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire across the landscape.
- Promote systematic information gathering to address the impact of insect infestations on forest and rangeland health.
- Improve the capacity to detect insect and disease infestations at an early stage, particularly with respect to hardwood forests.
- Protect, restore, and enhance degraded forest ecosystem components in order to promote the recovery of threatened and endangered species; improve biological diversity and enhance productivity and carbon sequestration.

HFRA specifically prioritizes federal land projects to the Wildland-Urban Interface (WUI), mandating that no less than 50% of the funds allocated for authorized hazardous fuels work will concentrate in the WUI.

The HFRA further prioritizes federal land projects near communities that support or help implement adjacent communities with approved community wildfire protection plans. In the Lake Tahoe Basin, all seven Community Wildfire Protection Plans have been completed and approved by the respective State Foresters. The balance of the federal land work will be concentrated on reducing risks to critical watershed areas. Currently the LTBMU is doing 100% of its fuels reduction work in the WUI.

Sierra Nevada Forest Plan Amendment (SNFPA)

The Sierra Nevada Forest Plan Amendment (SNFPA, Sierra Nevada Framework) provides direction to the 11 Sierra Nevada forests in order to:

- Protect, increase, and perpetuate old forest ecosystems and provide for the viability of native plant and animal species associated with old forest ecosystems,
- Protect and restore aquatic, riparian, and meadow ecosystems and provide for the viability of native plant and animal species associated with these ecosystems,
- Manage fire and fuels in a consistent manner across the national forests, coordinate management strategies with other ownerships, integrate fire and fuels management objectives with other natural resource management objectives, address the role of wildland fire, and set priorities for fire and fuels management actions,
- Reduce and, where possible, reverse the spread of noxious weeds, and
- Maintain and enhance hardwood forest ecosystems in the lower Westside of the Sierra Nevada.

These goals were delineated in the 2001 Record of Decision (ROD) (USDA Forest Service 2001). The 2004 ROD emphasizes the management of fire and fuels while retaining these goals (USDA Forest Service 2004). All except the last goal apply to the LTBMU, and will be reflected in the Vision, Strategy, and Design Criteria of the revised Forest Plan as well as in the monitoring and adaptive management plan. Some components of these goals will also be incorporated in the LTBMU Environmental Management System (EMS).

SNFPA management direction and goals were used to develop the Pathway 2007 vision and desired condition statements and are consistent with the Pathway products.

The revised Forest Plan will have guidelines, but no standards. We will analyze the SNFPA standards and guidelines and adopt all that provide appropriate sideboards for the management strategies adopted in the Lake Tahoe Basin.

Local Planning Efforts

A multitude of agencies and groups participate in the numerous local planning efforts underway in the Lake Tahoe Basin. Several of these affect LTBMU Forest Plan revision directly or indirectly.

Pathway 2007

The 1988 LTBMU Forest Plan was written to be in substantial agreement with the 1987 TRPA Regional Plan. The Lahontan Basin Plan was also brought into agreement with the TRPA Plan around this time. Memoranda of Understanding (MOUs) between the Forest Service and these agencies provide additional guidance for interagency relations and responsibilities. As the Forest Plan and the TRPA and Lahontan plans and regulations have been amended over the years, areas of difference have arisen, and the plans are not as well-synchronized as they were originally.

In 2002, the Pathway 2007 collaborative process was initiated to provide a coordinated interagency planning effort to bring agency plans back into agreement, and to define common goals and delineate strategies for improving environmental and socioeconomic health and well-being in the Lake Tahoe Basin. The Nevada Department of Environmental Protection joined the Forest Service, TRPA, and Lahontan in the Pathway 2007 process primarily to provide water quality guidance for the Nevada side of the basin.

Pathway 2007 is one of the major influences shaping the LTBMU plan revision. Interagency vision statements, desired conditions, indicators, and standards for ten resource areas have been crafted with substantial participation from local technical experts, science advisors with well-

recognized expertise, a public forum representing a diverse cross-section of local and national interests, and input from public meetings, phone surveys, and focus groups throughout California and Nevada. The need for change in the Pathway Agencies' desired conditions and standards has been documented in the Draft Pathway 2007 Draft Evaluation Report and subsequent addenda which incorporated public comment from the Pathway Forum and Technical Working Groups.

In 2006, the collaborative effort is focused on developing management strategies and proposing areas to implement specific strategies through a place-based planning effort which includes a series of interactive public meetings as well as discussions with the Pathway Forum. Additional information is provided in the Collaboration and Partnerships section of Chapter 3, and we will summarizing our findings and proposals in a series of Pathway 2007 documents and the revised Forest Plan.

The Lake Tahoe Restoration Act and the Environmental Improvement Program

In 1997, a Presidential Forum focused national attention on environmental degradation and the declining lake clarity of Lake Tahoe. This resulted in funding for the Federal share of environmental projects from 1998 to 2000, the formation of the Federal Interagency Partnership, creation of the Lake Tahoe Federal Advisory Committee (LTFAC), and adoption of the Environmental Improvement Program (EIP).

The EIP is a cooperative effort between local, state, and federal agencies to achieve the environmental thresholds set forth in the Tahoe Regional Planning Compact (PL 96-551) and to preserve, restore, and enhance the unique natural and human environment of the Lake Tahoe Basin. Scientists hypothesized that in order to reverse declining lake clarity, major restoration efforts must be completed within the next ten years. The combined federal, state, local, and private projects identified in the EIP totaled $908 million over a ten-year period. The federal share of the EIP was estimated at 30%, or $300 million.

A priority list of restoration projects for the Lake Tahoe Basin Management Unit is included in the EIP and, using the best available science, will help to achieve the environmental thresholds for air quality, fisheries, noise, recreation, scenic resources, soil conservation, forest health, water quality, and wildlife, with an overall program focus on erosion and sediment control, acquisition of environmentally sensitive land, and fire risk reduction activities. Much of the LTBMU program of work is centered around EIP projects.

Above Echo Lake

The Lake Tahoe Restoration Act (Public law 106-506, November 2000) authorized $30 million per year for 10 years to the Lake Tahoe Basin Management Unit for planning and implementation of EIP programs and projects. In addition, the LTRA authorizes the Secretary of Agriculture to provide annual funding in the amount of $10 million, to local

governments for erosion and sediment control projects on non-federal land in the Lake Tahoe Basin, provided the projects ultimately benefit federal land. As the only federal agency with land management responsibilities in the basin, and the only federal agency with the requisite in-house engineering, hydrological, and fiscal staff, the LTBMU has administered the grants since the program's inception. A technical review committee comprised of federal, state, and local agencies selects projects that most effectively meet the intent of the LTRA and the region's restoration goals.

In 2003, Senator John Ensign (R-NV) sponsored an amendment to the Southern Nevada Public Lands Management Act (SNPLMA) (PL108-108), to provide $300 million over eight years to fund the LTRA. In addition, the amendment allowed the other members of the Federal Partnership to receive funding from SNPLMA for EIP projects at the Lake Tahoe Basin.

Since 2001, the LTBMU has completed 135 EIP projects at a cost of almost $100 million with another 84 projects in progress. Accomplishments include:

- the assessment and restoration of several impaired watersheds,
- the decommissioning, BMP retrofit, and/or re-route of over 600 miles of roads and trails,
- the BMP upgrade of a number of recreation sites, including Zephyr Cove Campground, Eagle Falls Trailhead, and Inspiration Point,
- the purchase of over 2,300 acres of environmentally sensitive land, and
- forest health fuels reduction treatments on over 12,500 acres of land.

Lake Tahoe TMDL

The Total Maximum Daily Load (TMDL) project is being developed within the Tahoe Basin by the Lahontan Regional Water Quality Control Board. This project will utilize models to determine the needed reductions in fine sediment, nitrogen, and phosphorus input to achieve the desired lake clarity. Needed reductions will be translated into pollutant load allocations. Those load allocations will then be refined through the Pathway 2007 process as part of an Integrated Water Quality Management Strategy (IWQMS). The IWQMS will determine the maximum feasible pollutant load reductions and the final TMDL will contain the refined pollutant load allocations by late 2007 or early 2008.

LTBMU Programmatic Management Plans

Most program areas have developed one or more multi-year management plans (Table 1). These plans are on different schedules, beginning and ending in different years. As the Forest Plan revision proceeds, we will need to plan for adjustment of programmatic goals in the future to correspond with the revised Forest Plan.

Table 1. Current LTBMU Programmatic Management Plans

Department	Program Area	Name of Plan	Years	Status	Plan Description
Engineering	Roads	Roads ATM	2000-2005	Will be updated 2006-2007	Priorities include 1) identify roads that are threats to water quality and are not necessary for access 2) develop treatments such as BMPs for necessary roads 3) decommission roads that are not necessary
Engineering	Trails	Trails ATM	2000-2005	Will be updated 2006-2007	Priorities include 1) identify trails to be restored or upgraded 2) decommission duplicate trails and those with high risk to resources
Engineering	Capital Projects	R5 & LTBMU Continuous Improvement Project Program	2006-2008	Updated annually	Priorities include completing deferred maintenance at LTBMU facilities, utility systems, and other improvements.
Ecosystem Conservation	Monitoring	Fire Year – LTBMU Monitoring Plan	2005-2009	Updated annually	A five-year plan that displays management/monitoring questions by resource area, and the monitoring efforts to address those questions. Includes implementation, cause/effect, and status/trend monitoring.
Ecosystem Conservation	Restoration	Ecosystem Restoration Mission Statement & Business Plan	2002-2011	Updated every 10 years	Goals include 1) restore natural processes that sustain healthy ecosystem function 2) actively involve other LTBMU programs to to identify, design, and implement projects that benefit all programs 3) promote holistic ecosystem management through collaboration 4) develop internal and external outreach, environmental education/service-learning, information gathering, and information technology transfer.
Ecosystem Conservation	Sustainability	Wildlife, Fish and Rare Plants	2004-2006	Will be updated fall 2006	Priorities include 1) protect and maintain biodiversity 2) restore sensitive species habitats 3) planning, inventory, and monitoring of wildlife and botanical resources in order to determine the management and conservation actions to be taken 4) increased management of and education of the public regarding terrestrial and aquatic habitats
Vegetation/Fuels/Fire	Vegetation/ Fuels	Stewardship Fireshed Assessment	2006-2016	In place	Basin-wide prioritization of hazardous fuels treatment areas.
Vegetation/Fuel	Fire	Fire Management	2006	Updated	Priorities include 1) ensuring adequate fire suppression

Department	Program Area	Name of Plan	Years	Status	Plan Description
s/Fire		Plan		annually	capability, 2) protection of natural resources, and 3) fire management actions consistent with the forest plan. Goals include 1) Reduce threat of wildfire damage to human communities and natural resources 2) reduce the amount and intensity of uncharacteristically severe wildland fires 3) Where appropriate, reintroduce fire into the forest's ecosystems.
Recreation	Recreation	Recreation Site Facilities Master Plan	2006-2011	Near completion	The overall goal is to meet 5 critical success factors for the recreation sites program: 1) achieve customer satisfaction 2) be financially sustainable 3) be environmentally sound 4) maintain community sustainability 5) focus resources on highest quality recreation opportunities.
Recreation	Recreation	Tallac Historic Site Master Plan	1994	In use	To provide direction for management of historic sites emphasizing preservation and interpretation of its historic and natural resources for public enjoyment, including the conversion of the Boathouse to a community theatre.
Recreation	Wilderness	Desolation Wilderness Management Guidelines	1998	In place	To provide direction for the management of the wilderness area for the use and enjoyment of visitors in a manner that will leave the area unimpaired for future use and enjoyment as wilderness.
Recreation	Recreation	Heavenly Ski Resort Master Plan	1996	Currently being updated	To effectively meet the social, economic, recreation, and environmental objectives in the Forest Plan. Alpine skiing is emphasized as are dispersed winter and summer recreation.
Administration/ Deputy Forest Supervisor	Safety	Safety Plan	January 2002	In place	The priority of this plan is to prevent work errors that contribute to accidents and/or injuries, thereby protecting the lives and well-being of personnel, while achieving the production goals of the Forest Service.

Area of Analysis

Forest planning takes place on several spatial scales. We most commonly think of the plan as applying to the administrative boundary of the Lake Tahoe Basin Management Unit (Figure 3). While most of our management direction is applied at this scale, planning for some of the unique places in the basin requires a smaller scale view, and we need to look at scales broader than the administrative boundaries for other aspects of planning. In addition, wildlife do not comprehend administrative boundaries, so we need to consider the home ranges of various species when planning for ecological sustainability. Similarly, coordination with neighboring forests and other jurisdictions is important for vegetation management, wildfire suppression, and fuel reduction.

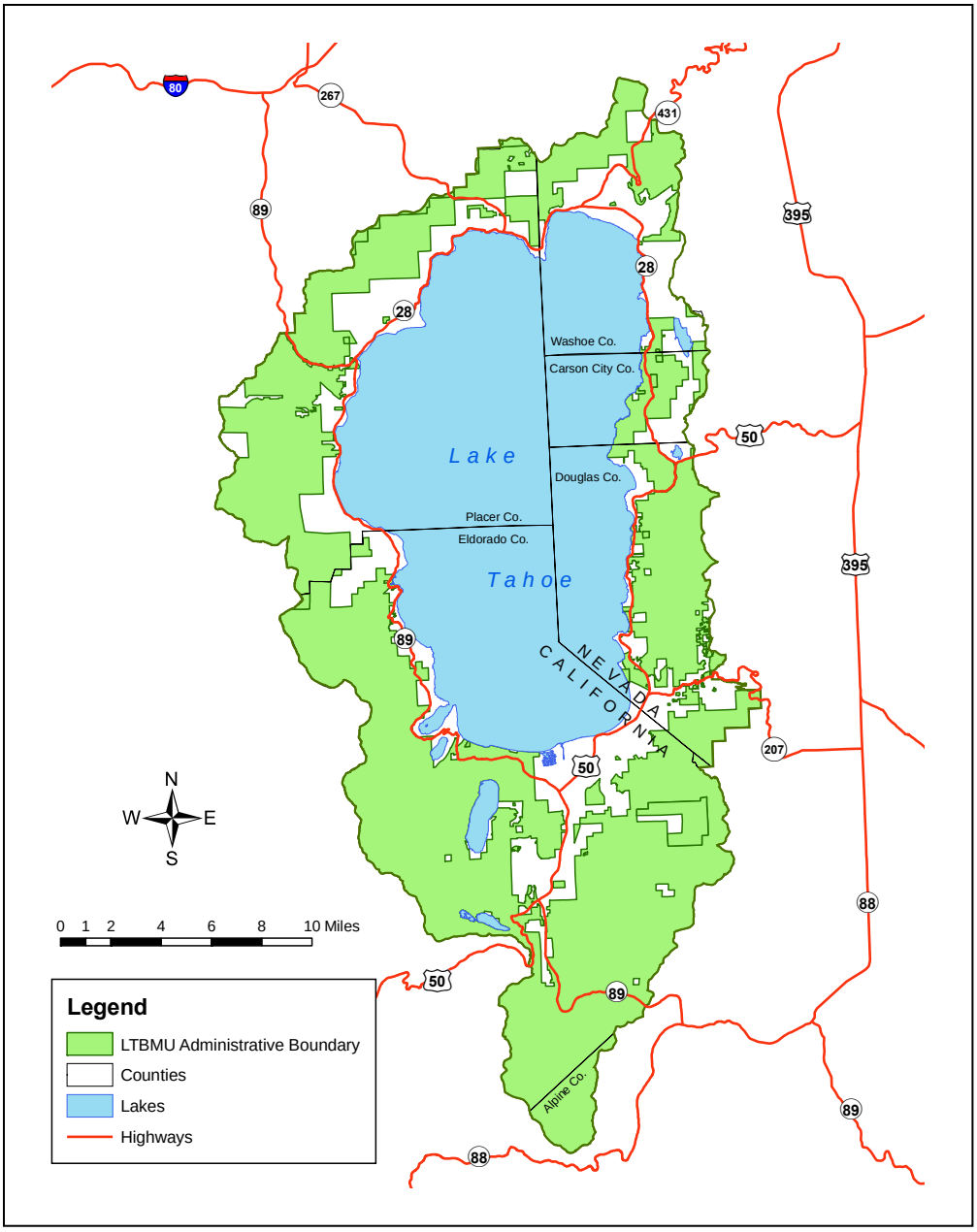


Figure 3. Lake Tahoe Basin Management Unit administrative boundary.

The Sierra Nevada Forest Plan Amendment (SNFPA) was developed to address such regional needs. The Terrestrial Ecologic Unit Inventory (TEUI) describes ecological types over a wide range of scales in a nested framework. Subsections are the broadest classification units at the Forest level - the Lake Tahoe Basin includes portions of four ecological subsections (Figure 4).

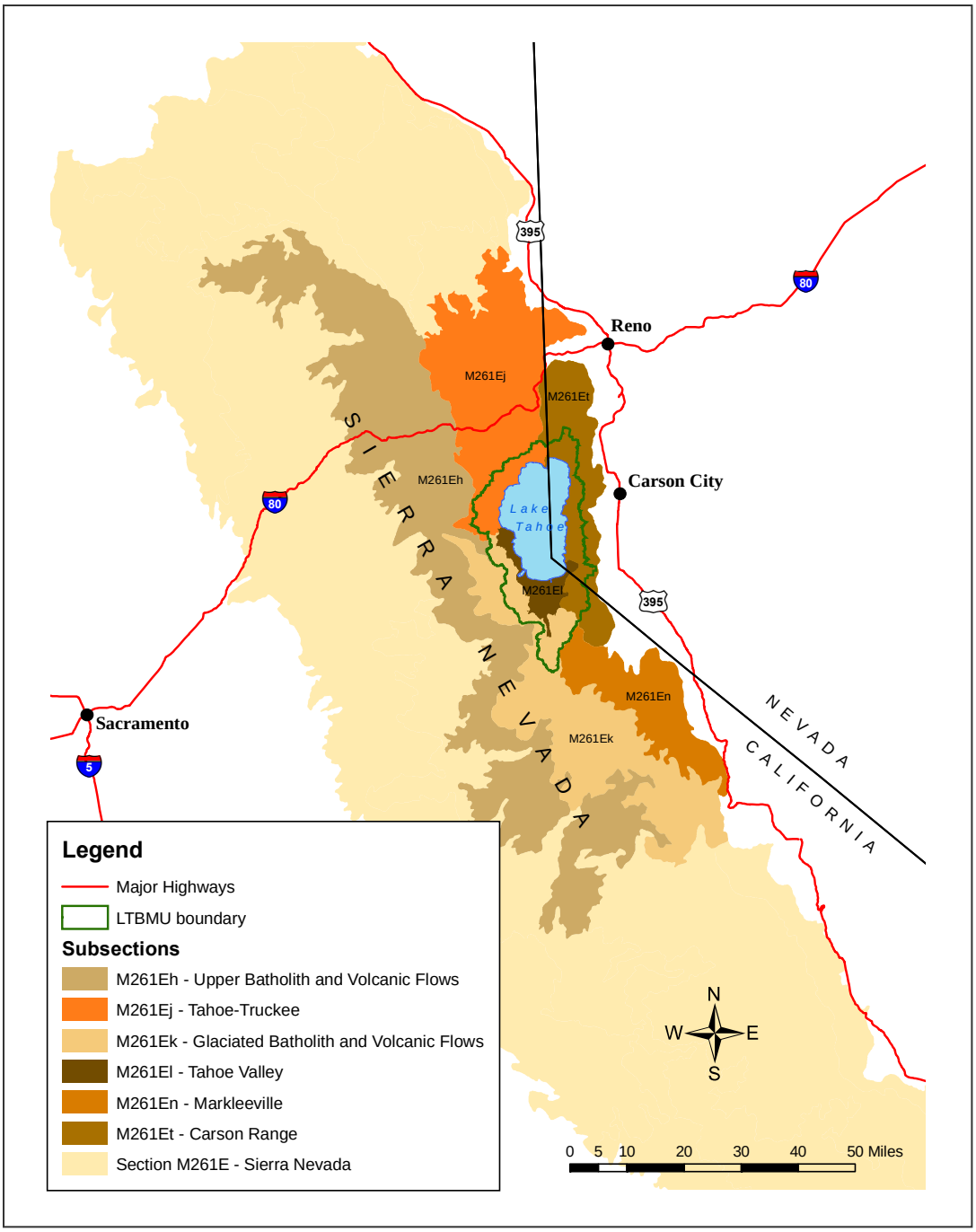


Figure 4. Ecological subsections of the Lake Tahoe Basin Management Unit (TEUI).

Social and economic considerations require an even broader scale. While 75% of our visitors come from California, Nevada, and Oregon, (Figure 5) the LTBMU has one of the highest percentages of international visitors in the National Forest System (8%).

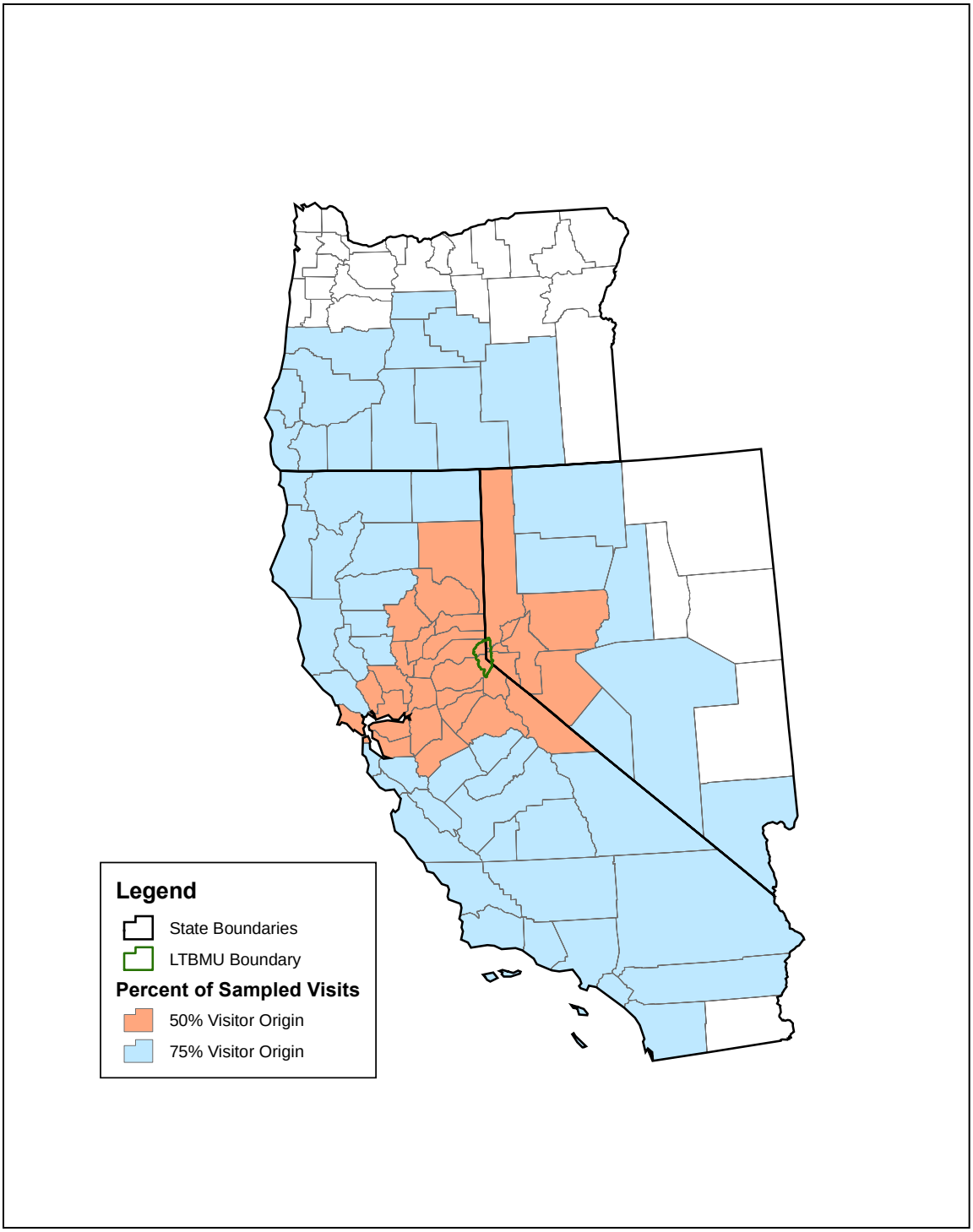


Figure 5. Visitor origins for the Lake Tahoe Basin Management Unit

The Lake Tahoe Basin Management Unit

The Lake Tahoe Basin Management Unit manages approximately165,000 acres. The Forest Service is the principal land management agency in the Lake Tahoe Basin, managing nearly 80% of the land within the basin, in four counties and two cities in California and Nevada.

The Forest Service's history here began in 1899 with the establishment of the Lake Tahoe Forest Reserve, which became part of the Tahoe National Forest in 1905. The Forest Service continued to acquire lands around Lake Tahoe in California and Nevada, and in 1973 the LTBMU was created from portions of the Toiyabe, Tahoe and Eldorado National Forests to provide unified management in the Lake Tahoe Basin.

One of the stated goals in the 1988 Forest Plan was to bring more of the non-urbanized lands in the Lake Tahoe Basin under public ownership to protect the environment from the adverse effects of development and to expand or protect public outdoor recreation opportunities. National Forest System lands have increased from around 148,000 acres in 1988 to 165,000 acres in 2006 and now comprise 80% of the total land in the basin, while the total land area in public ownership has increased to about 85%. Some of the LTBMU land acquisitions are large parcels, like the High Meadows purchase, but most are individual lots interspersed throughout urban areas.

The Lake Tahoe Basin Management Unit manages the natural and human needs of forest environments ranging from wilderness to urban forest in cooperation with many federal, state, local government, and business partners. The responsibility of the LTBMU is to conserve, restore and maintain the complex watersheds, habitats and forest ecosystems, while also providing for high quality recreation opportunities and appropriate resource use. LTBMU regulatory partners include the bi-state Tahoe Regional Planning Agency (TRPA), the Lahontan Regional Water Quality Control Board, and the Nevada Division of Environmental Protection.

Social and Economic Setting

Multiple generations of families, as well as those recently arrived, have strong ties to this area through recreation, business, tourism, and other activities. The scenery, wildlife, and the land itself create a distinct and direct tie to people's sense of place. Today, connections to the Forest are forged through activities and service-oriented livelihoods such as winter recreation, scenic and wildlife viewing, wilderness trekking, camping, fishing, horseback riding, historic lodging, and traveling to adjacent recreation activities such as waterborne and beach recreation, as well as casino gaming.

The character of the Tahoe Basin's landscape has changed over the last 100 or so years with population settlement and shorezone community development. Today's full time residents number 55,000. The area receives over 5 million visitors per year, with up to 250,000 visitors per day during the summer and on holidays.

The 2005 Planning Rule places an increased emphasis on the National Forests' contributions to social and economic sustainability, which will result in an increased focus on these areas in the revised Forest Plan and possibly in subsequent management actions. The LTBMU's key management priorities are restoration, fire and fuels, and recreation, which are reflective of the

social values associated with the Lake Tahoe Basin. Within each of these priorities the social and economic nature of the basin is affected directly and indirectly.

Restoring and maintaining the ecological integrity of the basin's ecosystems is a guiding principle in LTBMU's projects and activities, which have multi-scale impacts. As the world's 11th largest lake by volume, preserving the quality of Lake Tahoe's waters supports the well-being of the global commons. Restoration also contributes to the resilience of forest ecosystems by mitigating global climate change through carbon sequestration benefits. On a local level, restoration enhances and preserves natural amenities such as lake clarity, scenic beauty, and air quality, which are some of the basic qualities that drive the basin's dominant industry: tourism.

Recreation tourism is the most common way people interact with public lands. As visitor use continues to increase, methods of defining recreational capacity that balance social, ecological and economic goals must be developed. Locally, managing to maintain a high amenity setting elevates property values which may limit access to housing for basin workers. As a federal land management agency, representing the public interest of all Americans, how can we best make resources equitably accessible to both resident and visitor populations? These are some of the larger issues the Forest Service is facing.

East Shore of Lake Tahoe

Social Equity and Economic Sustainability

The LTBMU contributes to the local economy by providing a range of employment opportunities within the agency, while also stimulating employment opportunities outside of the agency through Special Use Permitting. The recent rise in housing costs has forced many Lake Tahoe Basin employees to live outside of the basin, as wages earned in the basin have not kept pace with the real estate market. The imbalance between wages and the cost-of-living brings up issues of social equity and economic sustainability. Employees unable to afford local housing incur additional personal costs such as increased commuting time and increased auto expenses. When wages earned in the basin are exported to outlying communities, Lake Tahoe Basin communities' ability to capture and recirculate these dollars in the local economy is decreased, limiting the potential for economic diversification, a goal identified by basin stakeholders. In addition, locating employees who will commute for low-wage jobs has also been identified as an emerging issue for some permit holders. The role the Forest Service can play in helping the basin communities to achieve their goals is being clarified through the collaborative Pathway 2007 process and the related Place-Based Planning project.

Recreation

The LTBMU supports the Basin's tourism industry by providing facilities and managing the natural setting on Forest Service lands. The availability of developed and dispersed recreation effects area businesses' ability to capture dollars from day-use and overnight visitors. In

addition, special use permittees (private companies that operate businesses on Forest Service land) provide needed goods and services, and create local business and employment opportunities, as well as tax revenues.

Community Protection from Wildfire

Fire and fuels management is a critical concern for basin residents and homeowners. As a public land manager, the Forest Service is responsible for reducing the wildfire threat on National Forest System lands, thus reducing the potential for housing loss and other economic and social costs that result from wildfires near urban communities. Effective vegetation management in the Wildland Urban Interface (WUI) provides increased personal safety and property protection for residents. Although the fire and fuels program provides a social and economic benefit, fuel treatments using prescribed burns have encountered public resistance in the past, slowing project implementation and the timeliness of reducing wildfire threat to urban communities. Addressing and resolving these issues are central to ensuring public safety in the face of wildfire threat.

Currently, roughly 42,000 acres of National Forest lands, most near communities, are unnaturally dense and require fuels reduction treatments.

Fuels reduction will continue to be a priority program.

Fuels Hazard near Heavenly Valley Creek

Physical Setting

The Land and the Lake

Above Cascade Lake

The Lake Tahoe Basin is 506 square miles (~323,739 acres), with water covering 38% or 192 square miles of the total area. Approximately 330 small lakes, in addition to Lake Tahoe, dot the basin's landscape. Elevation ranges from lake level at approximately 6225 feet to over 10,000 feet above sea level. The land portion of the Lake Tahoe Basin is 314 square miles, with 63 watersheds that discharge directly into Lake Tahoe. The only outflow from Lake Tahoe is at the northwestern portion of the lake near Tahoe City, where the lake drains into the Truckee River and eventually feeds Pyramid Lake.

Lake Tahoe is the largest alpine lake in North America, and the eighth deepest in the world. Its size (12 mi wide by 22 mi long) and depth (1,654 ft) contribute to its clear, sapphire-blue waters, classified by aquatic ecologists as "ultra-oligotrophic," which indicates naturally low biological productivity. Lake Tahoe's water is 99.9% pure, and in order to provide additional water quality protection, the lake has been designated as an Outstanding Natural Resource Water by the Environmental Protection Agency.

Geologic Setting

The Lake Tahoe Basin is located in a geologic transition zone between the Sierra Nevada mountain range to the west, and the Carson range and the Great Basin to the east. Although the watershed is within the Sierra Nevada geographic region, its geology is characteristic of the basin and range. The Lake Tahoe Basin is comprised of three relatively distinct geologic landscapes - tertiary and quaternary volcanics and metavolcanics (northwest watershed), glaciated granite with significant moraine deposition features (west and southwest) and non-glaciated granites mantled by unconsolidated decomposed granite (east).

The Lake Tahoe Basin was formed by normal faulting of geologic blocks about 2 to 3 million years ago; where uplifted blocks created the Carson Range which rises on the east, and the Sierra Nevada escarpment on the west; down-dropped blocks created the Lake Tahoe Basin in between. The highest peaks of the Lake Tahoe Basin that formed during this process include Freel Peak at 10,891 ft (3,320 m), Monument Peak at 10,067 ft (3,068 m) (where Heavenly Valley Ski Area is located), Pyramid Peak in the Desolation Wilderness at 9,983 ft (3,043 m), and Mt. Tallac at 9,735 ft (2,967 m).

Snow, rain, and streams filled the southern and lowest part of the basin, forming the prehistoric Lake Tahoe. Modern Lake Tahoe was shaped and landscaped by scouring glaciers during the Ice

Age. Many streams flow into Lake Tahoe, but the lake is drained only by the Truckee River, which flows northeast through Reno and into Pyramid Lake in Nevada (USGS, 2005).

Climate

The climate in the Lake Tahoe watershed is considered typical of the Sierras, with summers dominated by long dry periods with an occasional convective storm. Often there is little to no precipitation from June to September. During the winter months, strong frontal systems from the Pacific Ocean, influenced by local topography, deliver the majority of the annual precipitation as snow. A significant east-west mountain range-induced gradient creates substantial differences in the amount of precipitation received on each side of the lake. Average annual precipitation ranges from 80 inches in the far western portions of the basin to lows of 15 inches at the center of the lake, while the eastern side ranges from 20 to 35 inches of precipitation. Average monthly temperatures recorded at a Tahoe City weather station range from 38.5˚ F in January to 77.7˚ F in July.

Ecological Setting

Animal and Plant Species

Physical and climatic conditions in the Lake Tahoe Basin provide environmental conditions and habitats for a variety of animals, plants, and habitats. At least 289 terrestrial and aquatic vertebrates occur in the Lake Tahoe Basin as residents or regular visitors. This total represents 217 bird, 59 mammal, 5 amphibian, 28 fish, and 8 reptile species. An additional 57 terrestrial species have been recorded in the basin as accidental visitors or as potentially extirpated species from the basin. Vegetation includes 1438 species, subspecies, and varieties of vascular plants. In addition, 115 nonvascular species or bryophytes and 612 species of lichen and fungi have been determined to occur or potentially occur in the basin. The three main vegetation zones in the basin, the montane, upper montane and subalpine zones, provide 24 different wildlife habitat types.

Lahontan cutthroat trout

Forest Structure

Since the 19th century, white fir and incense cedar have doubled in relative abundance, whereas Jeffrey pine has declined by half. Tree density is currently 184% of historic conditions, most of which is comprised of trees less than 16” in diameter. Current research suggests the majority of terrestrial vegetation communities in Lake Tahoe Basin has greater than 50% departure from historic fire return interval. Fire suppression management has resulted in a substantial departure from historic structural and species composition characteristics for most terrestrial vegetation types. High tree density and dominance of species intolerant to disturbance have several potential negative impacts which will not be improved under the current trend:

- Understory herbaceous and shrub growth and regeneration are suppressed.
- Trees are more vulnerable to effects of drought, and insect and disease outbreaks.
- Large high-intensity, high-severity, stand-replacing fires are more likely, which could reduce habitat diversity and availability, and alter soil properties.
- Habitat diversity is decreased. For example, shade tolerant conifer species, namely white fir, have encroached and become established in meadows and aspen stands. In some cases, conifer encroachment will result in a conversion of vegetation and habitat types if the current trend continues and conservation actions are not taken.

Aquatic Ecosystems

Aquatic ecosystems may be divided into lentic (flowing water) and lotic (water bodies). Lentic ecosystems provide eight habitat types ranging from fens to small ponds and lakes to Lake Tahoe. Lotic ecosystems provide nine habitat types ranging from intermittent alpine snow melt streams to small forest or meadow associated streams to large perennial rivers. In general, since the adoption of the 1988 Forest Plan, functional characteristics of aquatic ecosystems have improved as a result of stream restoration efforts and reduced grazing pressure. However, managers are increasingly concerned with the spread of non-native and invasive plant and animals throughout aquatic environments, and fire suppression has allowed some riparian areas to become overly dense with shade-tolerant conifers.

Terrestrial Ecosystem

The National Hierarchical Framework of Ecological Units provides a systematic and consistent way to describe the landscape. At the broadest scale, land units have been named domains, with divisions, provinces, sections, and subsections occurring at an increasingly finer scale (Table 2).

Table 2. The Forest Service National Hierarchical Framework of Ecological Units

Planning and Analysis Scale	Ecological Units	Purpose, Objectives and General Use	General Size Range (acres)
Global	Domain	Broad applicability for modeling and sampling, strategic planning and assessment and international planning.	Millions
Continental	Division		
Regional	Province		
Subregional/Forest-wide	Section	Strategic, multi-forest, statewide, and multi- agency analysis and assessment	Tens to hundreds of thousands
	Subsection		
Landscape/Forest-wide	Landtype association	Forest, area-wide planning and watershed analysis	Thousands
District/watershed	Landtype	Project and management area planning and analysis	Hundreds to less than ten
	Landtype phase		

Bailey et al. (1994) described the Framework as "... a regionalization, classification, and mapping system for stratifying the Earth into progressively smaller areas of increasingly uniform ecological potentials. Ecological types are classified and ecological units are mapped based on associations of those biotic and environmental factors that directly affect or indirectly express energy, moisture, and nutrient gradients which regulate the structure and function of ecosystems. These factors include climate, physiography, water, soils, air, hydrology, and potential natural communities."

According to the Terrestrial Ecological Units Framework (TEUI), the LTBMU is situated in the Humid Temperate Domain, Mediterranean Division, Sierran Steppe-Mixed Forest-Coniferous Forest Province, Sierra Nevada Section. Four subsections converge within the Lake Tahoe Basin (Figure 4) and include 1) Tahoe-Truckee, 2) Glaciated Batholith and Volcanic Flows, 3) Tahoe Valley, and 4) Carson Range. Within the four subsections there are 151 Land Type Associations which includes 213 ecological types.

Three vegetation (zones montane, upper montane and subalpine) occur in the basin and contain 24 different wildlife habitat types typical of the Sierra Nevada. Current research suggests the majority of terrestrial vegetation communities in Lake Tahoe Basin has greater than 50% departure from historic fire return interval. Fire suppression management has resulted in a substantial departure from historic structural and species composition characteristics for most terrestrial vegetation types. White fir and incense cedar have doubled in relative abundance, whereas Jeffery pine has declined by half. Tree density is currently 184% of historic conditions, most of which is comprised of trees less than 16" in diameter. High tree density and dominance of species intolerant to disturbance have several potential negative impacts which will not be improved under the current trend:

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Ecological & Land Use History

Evidence of past ecological conditions comes from pollen records, tree ring studies, and archaeological documentation during the Holocene period over the last 10,000 years. In the early part of this period (10,000-7,000 bp), glaciers receded as the climate became warmer and drier. Areas previously dominated by cold-dry sagebrush steppe converted to woodland types. Forested areas moved upward in elevation as warm and dry conditions continued through the middle Holocene (7,000-4,000 bp). These conditions also resulted in a decline in the water level of Lake Tahoe. The Late Holocene (4,000 bp to present) has been characterized by alternating cool-moist and warm-dry periods. The levels of Lake Tahoe and other lakes have gone up and down, as shown by several cohorts of submerged tree stumps.

The Lake Tahoe Basin was the ancestral seasonal home of the Washoe people for 8,000-9,000 years. Population size increased through much of that time period, especially during wetter periods that created more favorable living conditions. Also during this time period, this society shifted from hunting-based subsistence to greater dependence on diverse food sources, including plants. The Washoe made an annual trek from lower elevations to Lake Tahoe to fish, hunt, and gather plants. Some of the drainages with high resource value that were frequently visited, as indicated by greater numbers of archaeological sites, include the Upper Truckee, Blackwood Creek, and Taylor Creek.

As a part of plant gathering practice, individuals sometimes spread seeds or bulbs they were collecting. Shrubs and ferns were regularly thinned or pruned to enhance growth. Evidence is mixed about the frequency and intensity of fires set intentionally to clear areas or to stimulate growth. Nevertheless, it appears burning was used regularly, at least near camps, to increase visibility, reduce insects, and promote growth of plant food sources.

John C. Fremont led the exploration party in 1844 that first documented the location of Lake Tahoe. Subsequent exploration and surveys of the basin by government geology and mapping teams resulted in renaming the lake a number of times over the subsequent century, including "Mountain Lake," and "Bigler Lake" in honor of California's third governor (John Bigler). "Lake Tahoe" began to be used widely in 1862, when William Henry Knight, a federal geology surveyor and Tahoe enthusiast, changed the name on federal maps. The name "Lake Tahoe" was formally adopted by the California State Legislature in 1945.

An excerpt from James M. Hutchings' Scenes of Wonder and Curiosity in California (Hutchings, 1862) provides a graphic description of the area's geological and natural setting, as observed in 1861:

"The surrounding mountains rise from one to three, and, perhaps, in some cases, four thousand feet above the surface of the lake. They are principally composed of friable white granite, so water-worn that, although they are rough, and often covered with rocks and boulders, they show no cliffs or precipices. Their bases, of granite sand, rise in majestic curves from the plain of the valley to their steeper flanks. Many of the smaller hills are but high heaps of boulders, the stony skeletons decaying in situ, half buried in their granite debris. The shores of the lake, at least of its southern coast, are entirely formed of granite sand; not a pebble is there to mar its perfect smoothness.

"A dense pine-forest extends from the water's edge to the summits of the surrounding mountains, except in some points where a peak of more than ordinary elevation rears its bald

head above the waving forest. An extensive swampy flat lies on its southern shore, through which the Upper Truckee slowly meanders, gathering up, in its tortuous course, all the streams which flow from the south or south-east. The deep blue of the waters indicates a considerable depth to the lake. The water is perfectly fresh. The lake is well stocked with salmon and trout. It is resorted to at certain seasons by the neighboring Indians, for fishing. "

By the mid-1800's, Euro-Americans had settled in the Lake Tahoe Basin. Native occupancy and practices continued, although on a much smaller scale and in limited areas. The practices of the new settlers drastically changed the landscape. During the Comstock Era (1850's-1900), extensive clear-cutting occurred, to supply timber to the growing population and booming mining industry. Historic observations and plot-based stand reconstructions indicate that the pre-Comstock landscape was dominated by large trees that were widely spaced. Jeffrey, ponderosa, and sugar pine were the preferred timber species, although firs and incense cedar were also harvested. The second growth that returned to logged sites was described as fir-dominated, with much greater stem densities. Fire frequency remained high through this period, largely due to fires set during logging operations. Stream and lake sedimentation also was high as erosion increased on the logged slopes. By the early 1900's, mining needs decreased, the "easy" timber resources were exhausted and large-scale logging ceased. Tourism increased in the area, and the sheep and cattle grazing that began in the 1800's expanded. Fires were often set by sheep-herders to improve forage.

Spooner Summit-area lumber yard

By the 1920's, federal land management agencies had acquired much of the land in the basin, and fire exclusion became the national policy. As fire was the dominant ecological process affecting terrestrial (and possibly even aquatic) ecosystems, fire suppression has resulted in profound changes to Lake Tahoe-area ecosystems, including increased fuel-loading and forest densification, increased fire severity when wildfires escape control, decreased landscape heterogeneity due to loss of early seral habitats, loss of hardwood forest (e.g. aspen), decreased populations of those animal and plant species that require early seral habitat or habitat linked to open-canopied stands of mid and late seral vegetation, modifications in nutrient cycling processes, etc. The mid- to late-1900's were characterized by increasing urbanization, with grazing and logging restricted mainly to private lands. Water use and diversion affected the landscape, and many meadow systems were strongly altered during this period.

This document addresses some of the forest management challenges presented by Lake Tahoe's current popularity, as well as challenges created by resource extraction during the 19th and early 20th centuries and fire suppression during the 20th century.

Cathedral Meadow and Mt. Tallac