5 FIRE HISTORY AND MANAGEMENT

The forest and meadow conditions of the Taylor Tallac watershed result from a combination of physical and ecological processes, as described in Chapter 3. Some of these processes and their expression on the landscape have in turn been affected by a history of human use including grazing and infrastructure development, as discussed in Chapter 4. One of the more important processes affecting the watershed's ecosystems is fire, both natural and human-set, and its management, including suppression. This chapter provides an overview of the history of fire in the Taylor, Tallac, and Spring Creek watersheds based upon existing information, including the potential role of fire as a habitat enhancement tool.

5.1 HUMAN INFLUENCES ON FIRE PROCESSES

The occurrence of fire on the landscape requires suitable vegetative and weather conditions, and a source of ignition. Native American activities, early European-American settlement activities, 20th century fire suppression, and contemporary fire policies each contribute to the existing conditions of the watershed's ecosystems. In the short to medium term human activities can affect both vegetative conditions and ignition. (In the long term human activities may also be affecting climatic conditions.) There are in turn feedback loops between vegetation structure, climate, and the frequency, areal extent, and severity of fires.

5.1.1 NATIVE AMERICAN PRACTICES

The history of fire in the Lake Tahoe Basin begins with fires ignited by lightning. Lightning ignited fires are common, occurring especially in late summer. Humans also ignite fires, either intentionally or inadvertently. People have been present in the Lake Tahoe Basin for at least 8,000 to 9,000 years (Lindstrom 2000). The earliest archaeological evidence for humans in the Basin is found near Taylor Creek (Martin 1998, cited in Lindstrom 2000). In general, it is not possible to distinguish human-set fires from lightning fires in the sediment cores and tree ring analyses that provide fire history information at this time scale.

At the time of European-American entry into the Basin in the mid-1800s the Washoe lived in and utilized the Basin's ecosystems seasonally. While there is little direct evidence for the specifics of Washoe practice and its consequences for the Basin's ecosystems, the Washoe are believed to have set fires for a variety of reasons. Lindstrom (2000) has written: "Existing ethnographic data include testimonies from Washoe people about resource use and principles of conservation, but there has been little research focused on specific harvesting techniques or horticultural and conservation practices, " or, it might be added, on the ecological consequences of those practices. Ethnographic information for fire use is sketchy. This lack of information may, in part, reflect reluctance, in the face of European-American anti-fire sentiments, to admit to deliberate fire setting (Lindstrom 2000).

It is assumed, however, that fire was one of the more important Washoe land management practices, as it was for other Native American groups throughout the Sierra. The Washoe are known to have lit fires to keep camps clean and the forest open, to drive deer toward waiting

hunters, to increase the production of certain plants for food and fiber, to improve browse for deer, and to promote shoot growth used for basket making (Lindstrom 2000). Lindstrom (2000) reports that Washoe basket-weavers on one occasion asked Bureau of Indian Affairs to burn out a willow stand located on tribal land "like our ancestors did" to kill insects and promote new growth.

Native American practices elsewhere in the Sierra also provide clues to prehistoric fire practice and its ecological consequences within the Basin. Native Californians used numerous practices to manage the land for different purposes; burning was the most widely applied and effective tool (Anderson and Moratto 1996). Both small patches and extensive areas were burned. The most commonly reported purpose for burning was "to clear out the brush." Such burning promoted an herbaceous understory within woodlands and coniferous forests and was recognized as helping to prevent larger, more severe fires. Burning promoted seed, fruit, tuber, and corm production in gathered crops. Sometimes burned areas were sown with seed after fire. Fire was employed to stimulate the production of long, straight, shrub shoots for use in basket making.

Native burning in the Sierra had ecological consequences at both the patch and landscape scale. The fires ignited by Native Americans were generally of low-intensity. "It would burn off some of the new needles off but it wouldn't burn way down through the duff" (Anderson and Moratto 1996). Fires were usually set in the fall after rain. Frequent, low intensity fires contributed to the maintenance of an open forest structure and an open understory. Burning was also used to create, maintain, or enlarge small openings within a larger plant community. For example, stands of useful grasses such as deergrass (*Muhlenbergia rigens*) or edible native forbs such as strawberry (*Fragaria californica)* or *Madia* spp, could be maintained within mixed coniferous forest. Patches of yampah (*Perideridia* spp.) might be maintained within montane meadows. Individual shrubs or patches of shrubs might also be burned, e.g., willows (*Salix* spp.) or redbud (*Cercis occidentalis*), by piling brush around individual plants or stands (Anderson and Moratto 1996). They cite one report describing burning used to clear out "reed-choked marshlands" (Anderson and Moratto 1996).

Taylor Creek was cited by one account as the third most important fishery in the Basin for the Washoe (Lindstrom 2000; Chapter 6). The south shore of Lake Tahoe in general was also noted especially for "wild potatoes" (yampah) and onions (*Allium* spp.) (Lindstrom 2000). Flora James and Betty Cruz, Washoe sisters with long standing family ties to the Taylor Creek area, remember gathering and eating wild potatoes there as children (see discussion in Chapter 6). It is also reported that a certain, special type of willow was harvested from Taylor Creek for use in basket making (Chapter 6).

Given the known importance of the Taylor Creek area to the Washoe, it seems likely that the meadows and riparian forests of the focal study area were managed with fire in ways similar to the general practices described above. The frequency and consequences of those fires were likely also related to the climatic cycles of wetter and drier years described in Chapter 3. In many years, fires would have been difficult to set in the wetter portions of the meadows of the Taylor Tallac marsh, even in the fall. In other years, it may have been possible to burn the

drying shoots and leaves of the meadow's graminoids and forbs, but the root crown and roots would have remained moist and difficult to burn. Drier meadow areas may have burned more frequently. (Further discussion of meadow and riparian burning consequences is included in the Fire Regimes and Ecological Consequences section that follows.)

5.1.2 EUROPEAN-AMERICAN ACTIVITIES

The first sighting of Lake Tahoe by European-Americans was by Fremont in 1844. The first serious impacts on fire processes began in the 1860s as the Comstock mines began to be developed in Nevada. Lumber from Tahoe was cut to supply the mines and the associated towns. By the turn of the century some 60 percent of the Basin had been virtually clear-cut. The upper watersheds of Taylor and Tallac creeks were among the steep and relatively inaccessible portions of the Basin that were not cut during this time (Lindstrom 2000).

After the logging of the Comstock era, the slash left behind and second growth trees left Basin forests very vulnerable to wild fire. Steam-powered logging equipment, lumber mills, and railroads were among the sources of ignition for many severe fires. These fires were often large and destructive of both forests and human property, very different from the low intensity fires of the Washoe era. For example, in September 1889 the Sacramento Record-Union reported: "Witnesses fresh from the Lake Tahoe region inform us that almost that entire section is a scene of desolation on account of the destruction of fires…At the head of Emerald Bay last week a fire was raging for many miles extent, destroying the finest park of tree growth in all that region" (quoted in Strong 1984). Camps and towns were often consumed by fires, increasing desire to log around established settlements for fire protection. The desire to protect property led to fire suppression efforts.

5.1.3 FIRE SUPPRESSION

For most of the 20th century the primary goal of fire management in the Sierra, including the Tahoe Basin and the project area, was fire control. All national parks and national forests had, by the mid-1920s, developed and implemented programs to suppress fires (Beesley 1996). In 1926, U.S. Forest Service (Forest Service) adopted a policy to suppress all fires at 10 acres or less. This approach to fire management was mirrored by policies adopted by the Bureau of Land Management (BLM), California Department of Forestry and Fire Protection (CDF), and the National Park Service (NPS) (Husari and McKelvey 1996).

Fire suppression programs were developed and successfully applied, resulting in a substantial reduction in the acres burned (Husari and McKelvey 1996). In the Basin, the combination of a relatively short fire season with fire control efforts has meant that no fire greater than 2,000 acres has occurred since 1908. The largest fire since 1908 was 1,013 acres in 1918. Between 1974 and 1996, only nine fires larger than 10 acres were recorded in the Basin, and the largest of these was 160 acres (Manley et al 2000).

These Basin-wide figures accurately reflect the situation in the Taylor Tallac and adjacent watersheds. Records kept by the California Department of Forestry and Fire Protection and the Forest Service record four fires in the Taylor Tallac watershed since 1921 (Exhibit 5-1).

(The most recent, a 2003 controlled burn that escaped and burned a larger portion of the meadow, is not mapped in Exhibit 5-1.) Two fires are recorded in the adjacent Cascade watershed.

After the extensive logging in the late 19th century and more than three-quarters of a century of concerted fire suppression efforts, the Basin's forests differ dramatically from those of pre-European-American times. Contemporary Basin forests are young and relatively uniform. In the watershed, many of the second growth forests lack structural diversity.

Having a widespread area of young forests with lower tree heights, thinner bark, and lower crowns, results in higher susceptibility to high-mortality fires (Manley et al. 2000). Species tolerant of shade, such as white fir, have increased in abundance. With greater stand density, water and nutrients are distributed across a greater number of trees, leaving individual trees more susceptible to drought stress, and subsequently to insect infestation. It was noted during reconnaissance, that many of the forests in the survey area had a large component of white fir, and it is possible that overstocking, in combination with a long drought, resulted in the large die-off of lodgepole in the focal study area.

5.1.4 CONTEMPORARY FIRE POLICIES

Over the last couple of decades, numerous studies have shed light on the risks and impacts of the extended period of fire suppression. Consequently, there has been a shift in policy to the management of fuel load, and fire has been recognized as a habitat enhancement and land management tool. The Federal Wildland Fire Management Policy was revised in 1995 to read "Wildland fire will be used to protect, maintain, and enhance resources, and be allowed to function as nearly as possible in its natural ecological role." Forest Service, BLM, NPS, State Parks, and CDF have similar policies that focus on reducing suppression efforts and protecting resources. The current forest plans for Tahoe National Forest and the Lake Tahoe Basin Management Unit allow the use of appropriate suppression response (ASR) on all fires on forest land. ASR consists of a range of suppression strategies (contain, confine, and control) used to cost-effectively respond to fires (Husari and McKelvey 1996).

Policies have also changed to allow more use of prescribed fire as a management tool to reduce fuel load and restore natural functions of ecosystems. The potential effectiveness of prescribed fire in mimicking the effects of natural fires is uncertain. Currently (2000 data), less than 1,000 acres are underburned in the Lake Tahoe Basin, in contrast to the estimated 8,000 acres, or more, that burned historically (Manley et al. 2000). Area burned, fire intensity, and timing of burns also differ from historical patterns.

5.2 FIRE REGIMES AND ECOLOGICAL CONSEQUENCES

5.2.1 MIXED CONIFER FORESTS

The average pre-European-American settlement fire-free interval for mixed conifer forests on the west shore of Lake Tahoe has been estimated to range from five to 13 years (Rice 1988, Rice 1990, cited in Taylor 1999). In a series of studies on both the east and west shore Taylor

(1999, 2000, 2001, and 2002) has provided data to refine and extend our understanding of pre-European-American fire regimes in the Tahoe Basin. Based upon his analysis of fire scars in remnant stumps in Jeffrey pine forests on the east shore, Taylor (1999) estimated that within the 6,000 hectare study area (Sand Harbor to Zepher Cove) a fire had occurred somewhere within the study area approximately every one to two years between 1160 and 1873 AD. In a study of fire scars in extant old growth (that is, not logged during the late 19th century) stands on the west shore, he found a similar pattern. A fire occurred somewhere within the study area about every two years between 1615 and 1926 AD (Taylor 2000). One of the west shore study sites was at Emerald Bay, therefore reasonably close to the Taylor Tallac project area.

In both studies, most fires occurred after radial growth had stopped, though this was expressed less strongly on the west shore than the east. In the west shore study the longest period without a fire at any of the 18 sites was six years. Fire return intervals (FRI) varied from 7.5 to 29.5 years, indicating variability of FRI between sites. Annual variability in the extent of fire was high. Variability in fire size promotes structural and compositional diversity (Taylor 1999). Fire suppression in west shore sites facilitated compositional shifts from fire tolerant to fire-intolerant species and an increase in forest density (Taylor 2000).

Many of the years that had extensive fires on the west shore were also years that recorded widespread burns on the east shore, indicating that regional climatic factors may have played a role. In a study designed to address this question, Taylor (2001) found that years when the largest number of watersheds within the Basin burned coincided with years of intense drought as indicated by tree-ring growth. The pattern of these droughts showed a decadal-scale variability in precipitation (Taylor 2001) that is consistent with regional climatic patterns as discussed in Chapter 3.

Not all fires during the pre-European American era were low intensity however. In a study of montane chaparral in unlogged locations Taylor (2002) found evidence that infrequent stand replacing fires were indeed part of the fire regime. Various lines of evidence indicated that large fires initiated these contemporary chaparral stands. Two of Taylor's chaparral study sites are within the Taylor and Tallac watersheds, one just west of Fallen Leaf Lake and the other near Mt. Tallac. The last fire at Fallen Leaf was in 1861 and the last fire at the Tallac study site was in 1881. Fire suppression has caused some montane chaparral sites in the Sierra to convert to forest, though at both Tallac and Fallen Leaf chaparral still covers large areas despite some tree invasion (Taylor 2002). Fallen Leaf had the lowest conifer density of the study sites but had the highest basal area because the trees were large. Montane chaparral can provide important habitat for deer, small mammals, and birds. While there are challenges to prescribed high severity fire, its use may be necessary to maintain heterogeneous landscapes in mixed conifer forests in the Basin.

5.2.2 WETLANDS

The role of fire in wetlands is not well-studied, and may seem counter-intuitive. Keddy (2000), in a brief review, describes studies indicating the importance of fire as a structuring agent in a range of ecological situations including wetlands of the southeastern U.S., boreal circumpolar

peatlands, and the Everglades. In all cases, fire becomes more important during prolonged periods of drought.

As suggested above in the discussion of Washoe fire practices, it seems likely that the frequency and ecological consequences of fire in the Taylor Tallac meadows was related to drought cycles. In wet years, fires would have been difficult to set in the wet meadows of the Taylor Tallac marsh, even in the fall. In other years, burning the drying shoots and leaves of the meadow's graminoids and herbs would have been possible, leaving plant crowns and roots unaffected. The controlled burn that escaped and burned part of the meadow in 2003 left much of the heavy thatch layer unburned, though it did create some irregular openings in that thatch. However, in periods of extended drought, the meadow's vegetation may have been more susceptible to carrying hotter fire. Loveless (1959) and Vogl (1969) (both cited in Keddy 2000) found that during extensive droughts, more intensive fires can burn organic matter in the soil, creating new depressions.

There is no information on fire regimes in riparian areas, meadows, or wetlands in the Tahoe Basin (Manley et al. 2000), except for the sparse information on Washoe practices already discussed. Chang (1996) likewise states that "very little information exists" for fire effects on subalpine meadows, however information is described from one lightning-ignited burn at Ellis Meadow in Kings Canyon National Park in 1977. In that fire, grass and graminoid species recovered quickly after fire, increasing from an 8 percent groundcover one year after fire, to 75 percent four years after. Lodgepole seedlings were killed but sapling and pole-sized trees were not. This effect was observed by LTBMU in the burn at Taylor, where the lodgepole were not destroyed by the fire. The burn was more intense in flat areas dominated by wideleaf sedge. Subsurface fires did not carry well through the above ground fuels and smoldered around them. Where the burn was less intense, the effect was even patchier, burning often limited to the troughs between hummocks and green vegetation was rarely totally consumed (Chang 1996).

The tree ring and fire scar data used to estimate fire frequency and extent in mixed conifer forests can not help us to understand the ecological consequences of fires in meadows, though studies of lodgepole pine invading meadows or lodgepole stumps can help in estimating timing of fires and droughts. These methods could be utilized to better understand the relationship of fire and lodgepole encroachment within meadows in the focal study area. Studies of charcoal layers in Yosemite and Sequoia National Parks show that meadows burned once ever 250 to 300 years (Chang 1996). However, the charcoal layer record likely severely under represents less severe burns. In some years, fires that burned surrounding forest may stop at the edge of wet meadows, resulting in a lower fire frequency for meadows. On the other hand, small, patchy, fires deliberately set to manage particular resources like yampah probably don't show up in the fire history record. In general it is not possible to distinguish between Native American set fires and lightning set fires in fire scar data. Fire scar data also tends to under record very light fires. The tendency for larger, more extensive fires to be correlated with regional drought further complicates the question.

5.2.3 RIPARIAN

There is no information on fire regimes in riparian areas in the Tahoe Basin (Manley et al. 2000), and limited information on fire regimes in riparian areas in the Sierra. However, fire history studies on the Eldorado National Forest and in Klamath Mountains do indicate the presence of fire in riparian areas.

Fire return intervals vary by the size and landscape position of the riparian areas. Fire return intervals for large perennial streams at the bottom of slopes (like, for example, Taylor Creek) are longer than for upland drainages, which basically mirror the interval of the surrounding forest (Manley et al. 2000). This is logical because they tend to be wetter in dry years. Similarly, it is likely that riparian zones that are narrower would be more likely to have frequent fires than ones that are wider. Some data taken from an area north of Mount Shasta in the Klamath Mountains suggests that riparian areas have longer and more variable FRIs than nearby upland areas. Riparian FRIs were 26 to 52 years, where adjacent uplands had FRIs of 12-15 years. A similar conclusion came from data taken in the Shasta-Trinity Divide, in the Trinity River watershed. Upland FRIs were 13-14 years and the riparian FRI was 29 years. In this same location, only ten of nineteen fires were recorded on both sides of the riparian zone, indicating that the moisture of the zone reduced the spread of the fire (Skinner and Chang 1996).

The same caveats discussed under montane meadows apply to our understanding of riparian zone fire. That is, low intensity and very localized fires are underrepresented in the fire history data, and the role and effects of Native American burning is difficult to distinguish. As with meadows, without Native American localized burning, the frequency is reduced in riparian zones, and increases in conjunction with drought.

5.2.4 LODGEPOLE

Although there are many factors including climate cycles, grazing history, and lowering of groundwater levels due to stream downcutting that can affect lodgepole establishment in meadows, fire is known to be important. However the effects of fire are variable and interactive with these other factors. At the Ellis Meadow fire discussed above, lodgepole seedlings were killed, but not saplings or larger trees. On the other hand, the effects of the 1994 fire at Taylor Marsh can still be seen on the landscape. This fire came at the end of seven years of severe drought. Virtually all the lodgepole in the fire zone were killed (Chapter 4). Wet years returned in 1995. In 2004, numerous lodgepole seedlings can be observed in the fire- killed area along the southern edge of the beach ridges. However, no lodgepole seedlings are found immediately south of this area where the ground lower in elevation and is considerably wetter.

5.2.5 ASPEN

There is little data on aspen fire regimes in the Sierra Nevada (Skinner and Chang 1966). In other parts of the West, aspen stands are known to require infrequent stand replacing fires to initiate and develop. This may not be the case in the central and southern Sierra. Based on the locations where aspen generally occurs in the Sierra (e.g., around moist meadows, near

rock piles at the base of cliffs, etc.), fire may not be essential to aspen establishment and persistence (Skinner and Chang 1996). On the other hand, in the Northern Sierra and the Cascades, aspen may be successional to conifers such as red fir and white fir. Significant conifer encroachment was not observed in aspen stands during reconnaissance surveys of the focal study area.

5.3 ROLE OF FIRE FOR HABITAT ENHANCEMENT

Pre-European-American fire regimes, whether set by lightning or humans, were frequent, low intensity surface fires that contributed to the creation of fine-grained multi-aged stands (Taylor 1999). As recognition of the importance of fire's role in ecosystem function has grown, prescribed fire is being incorporated more frequently into the restoration, enhancement, and management of lands in the Lake Tahoe Basin. Prescribed burning is being used for fire hazard reduction, fuel load management, and restoring important ecosystem processes in the focal study area, including burns in the large lodgepole stand.

Mechanical treatments can be used to accomplish certain objectives; however, fire provides a number of essential functions that cannot be mimicked by a mechanical treatment. The heat and smoke generated by fires is required by some species to germinate, therefore fire is crucial to those species' survival. In addition, fire actively reduces and removes duff and understory layers, where mechanical treatments may only redistribute the fuel that remains on site.

To reintroduce fire to the landscape, broadcast burning has been used to clear brush and understory growth and mimic natural fires ecosystem effects. Broadcast burning is generally applied during moist soil conditions and is low intensity and widespread. The fire generally does not burn hot enough to consume the leaf and litter layer, where most soil nutrients are found. In preparation for a prescribed fire, the large fuel items are removed by other means (i.e. logging, yarding, and chipping) (Poff 1996).

Pile burning is another method used to reduce biomass. Slash is removed and piled in several locations on the site and then burned. This is a cost-effective and easily-controlled alternative to broadcast burning; however it may result in higher intensity fires and consequent soil sterilization, and sometimes contributes creating openings for the he establishment of invasive species (Korb et. al 2004).

Underburns are also used and result a less uniform burn approach. Underburns are intermediate in effect between pile and broadcast burning, because they are less intense, and result in a patchy vegetation pattern and less nutrient loss. The low flame heights of an underburn scorch the lower edges of the tree crown, adding to the duff layer and protecting from erosion. Additionally, the fire oxidizes the forest floor by removing organic matter, thereby releasing nutrients and stimulating growth (Poff 1996).

5.3.1 ENVIRONMENTAL AND REGULATORY CONSTRAINTS FOR FIRE AS A MANAGEMENT TOOL

The potential negative environmental effects of prescribed fire include impacts to water and air quality, as well as to sensitive biological resources. While these potential consequences are

important to consider wherever prescribed buring is being considered, potential impacts to water quality are of special concern in the Tahoe Basin. Therefore, Lahontan and TRPA, while supportive of the concept of prescribed fire, tend to scrutinize its proposed use closely.

Compliance with federal, state, and local regulations, liability issues, and safety concerns must all be considered when applying prescribed burns. A burn plan for the site must be prepared as a legal document for the prescribed burn that includes all the pertinent information for the use and implementation of a prescribed fire. This can be called a Site Fire Management Plan, which includes background information, fire management justification, goals and objectives, fire regime proposal, site specific fire operations, smoke management plan, neighbor and community factors, monitoring and research, and adaptive management strategies. In addition to preparing the Site Fire Management Plan, permits would be required by the El Dorado Air Quality Management District, including a Burn Permit, Smoke Management Plan Application Form and a Controlled burn/Prescribed Fire Notification Form.

Consultation with the Department of Fish and Game and the U.S. Fish and Wildlife Service would be required to evaluate the potential impact, directly or indirectly through habitat modification, to a state or federally listed Threatened, Endangered, or Species of Special Concern. Additionally, a Timber Waiver or other permits from the Lahontan Regional Water Quality Control Board may be required for water quality purposes. The Tahoe Regional Planning Agency (TRPA) has restrictions and standards in the Code of Ordinance that would apply to the project. Provisions include restrictions to Tree Removal (Chapter 71), Prescribed Burning (Chapter 72), Vegetation Protection and Management in a Stream Environment Zone (SEZ) (Chapter 74), and Sensitive and Uncommon Plant Protection and Fire Hazard Reduction (Chapter 75). TRPA requires a Burn Prescription that is similar to the Site Fire Management Plan described above.

5.3.2 PRESCRIBED FIRE IN THE FOCAL STUDY AREA

Since, as discussed above, there is so little known with certainty about prehistoric fire regimes in wetlands and riparian areas of the Basin, as well as about the potential ecological consequences, habitat enhancement utilizing prescribed fire should be undertaken on an experimental basis. Experiments should be designed to be scientifically useful and statistically valid. This requires replicated plots and controls. Small plots should be used across a range of landscape positions. The tests will need to be carried out over a long time period, at least a decade, in order to begin to access the role of climate variation which tends to have decadal-scale cycles.

This small scale approach may also be used to test potential effects of Washoe management practices. Very small patches of willows could be burned and effects recorded. Similarly, very localized manipulations, including fire and harvesting could be used to manage yampah and other species in patches within the meadow.

5.3.3 ASPEN

Without some type of infrequent disturbance regime, such as low intensity fire or windthrow, aspen stands may be replaced by shade tolerant conifers such as white fir. Significant conifer encroachment was not observed in the aspen stands of the focal study area during reconnaissance surveys. Some aspen stands adjacent to Tallac Creek near SR 89 did exhibit signs of disease (a rust fungi), but these trees did not appear unhealthy overall. However, stands in the vicinity of the Stream Profile Chamber at Taylor Creek did appear diseased and unhealthy. These aspens had black cankers on their stems and black-spotted leaves.

Prescribed fire is one tool that may used to rejuvenate aspen stands by killing conifer seedlings, triggering root sprouting, and removing diseased trees. Precautions should be taken to keep the fire intensity low during such treatments. Aspens are shallow-rooted and intense fires can kill the root system, the majority of which is in the upper 13 inches of soil. Stand thinning may also achieve similar results in aspen stands.

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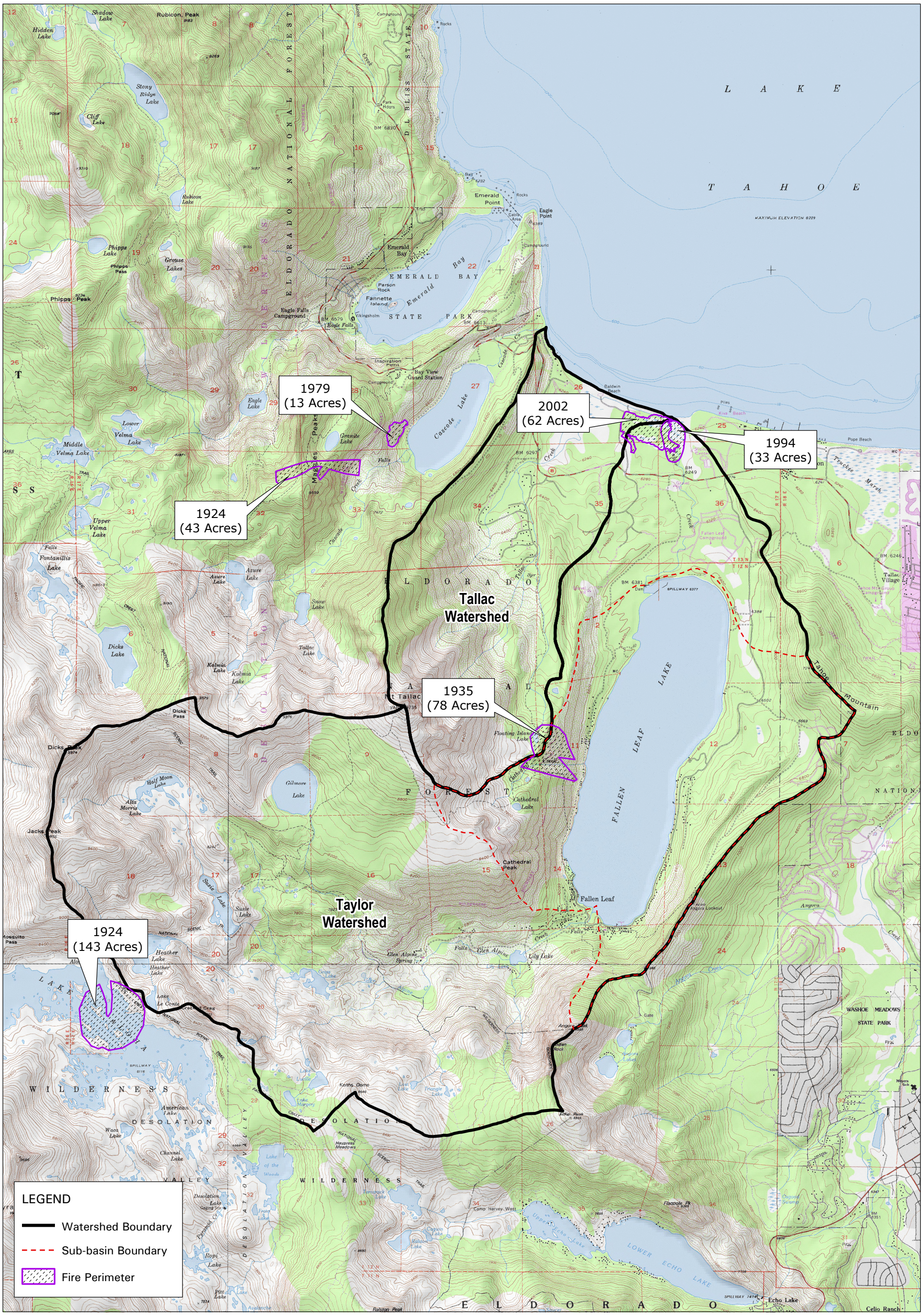

Sources: CDF 2004, USFS 2004, TRPA 2001

Fire History

EXHIBIT 5-1

Taylor, Tallac, and Spring Creek Watershed EAR
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