Polaris + Pomin Wetland Restoration Feasibility Study

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Prepared for

TAHOE RCD
WE DO CONSERVATION

CALIFORNIA TAHOE CONSERVANCY

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EXECUTIVE SUMMARY

Tahoe Resource Conservation District (Tahoe RCD), in cooperation with the California Tahoe Conservancy (CTC), California State Parks (CSP), Tahoe City Public Utility District (TCPUD), and Placer County, is administering an effort to complete a restoration feasibility study for the Polaris Creek wetland complex at Robert Pomin Park in Tahoe City, California. The wetland complex is one of the largest historical lake shore wetland complexes on Lake Tahoe's north shore, and has been impacted by historical land use activities to the point that its geomorphic, ecological, and water quality functions have been degraded. Restoration of the Polaris Creek wetland complex is significant to the larger-scale effort to improve the clarity of Lake Tahoe and enhance habitat for endangered and special interest species. The Project site presents a unique opportunity to restore natural water filtration qualities to the Polaris wetland complex because of its location and the fact that the property is owned and managed by various public agencies. Moreover, restoration of the wetland complex would connect fragmented pieces of wildlife habitat and provide a corridor from the shoreline of Tahoe to upland environments.

Contextual background information on Pomin Park is presented in this report to characterize the disturbance history, site-specific constraints and opportunities, and provide the scientific foundation that links the restoration designs to the project goals and objectives. The existing conditions analysis showed that there are areas of functional, high-quality habitat within the Polaris Creek wetland complex, however, the system has been gradually fragmented by various development projects. The most severe impairments are (1) placement of fill, and (2) channel realignment and straightening. The hydrologic support for the wetland complex is primarily via groundwater discharge from multiple springs, which appear to be minimally disturbed, so if impacts to the landscape can be undone, the wetland complex is anticipated to rebound.

Conceptual restoration designs for the Polaris wetland complex are presented in this report, with the goal to restore Stream Environment Zone (SEZ) functions, as defined by the Tahoe Regional Planning Agency (TRPA). The designs are based on an understanding of the disturbance history, existing impairments, and constraints and opportunities of the Project site. The general restoration approach is to remove fill and promote the spreading of surface water. The restoration designs are presented in terms of three geographic zones, and within each zone, two "design elements" are offered: one design element to represent the maximum restoration potential within the site-specific constraints and one design element to represent a scaled-back (yet meaningful)

amount of restoration that also addresses community-driven needs. The design elements are intended to be compatible with one another so they may be combined during future project phases to form a preferred alternative, but this feasibility study does not make recommendations for a preferred alternative; this process will be done collaboratively among the landowners, project stakeholders, and the public.

To achieve the maximum restoration potential, certain existing facilities within the vicinity of the Polaris wetland complex would need to be relocated. Pomin Park (athletic fields, playground, and parking lot) and the Lake Forest Campground—although they provide a high level of service to the community—are considered to have the most potential for relocation while other existing facilities (Lake Forest Boat Ramp and the U.C. Davis Tahoe City Field Station) were considered not feasible for exploring relocation. As such, this feasibility study explores restoration potential associated with relocating (or reconfiguring) Pomin Park and the Lake Forest Campground, as well as opportunities on the east arm of Star Harbor (California State Parks land) which does not require relocation of existing facilities. Concurrently, feasible relocation receiving sites are identified and screened to arrive at those which could reasonably be assumed to be available for the proposed uses. Four potential relocation sites are identified for the Pomin Park facilities (athletic field) and seven relocation sites are identified for the campground. The feasibility study considered relocating these recreation uses to different locations that would provide amenities that are equal or better than those at the existing Pomin Park and Lake Forest Campground. Similar to the restoration feasibility study, the relocation study does not draw conclusions on if or where Pomin Park and/or Lake Forest Campground should be relocated; rather, it only provides preliminary technical screening to help guide future decision making.

Public outreach was conducted to engage the community on the restoration and relocation efforts, and to gain an understanding of how the community uses and values Pomin Park and Lake Forest Campground under existing conditions. The results showed that the community is generally supportive of the project, and that there is high demand for athletic fields in the North Lake Tahoe area. Findings from the public outreach effort are incorporated into the restoration designs and the relocation site design and screening process, however, due to the variety of feedback received, no one solution satisfies all of the comments. Additional public outreach will be conducted during future project phases.

Future phases of the project will largely be defined by navigating numerous local, state and federal regulatory programs. Additionally, the environmental effects of the project

will need to be evaluated through the California Environmental Quality Act (CEQA), TRPA Environmental Documentation Program, and possibly the National Environmental Policy Act (NEPA). Since the feasibility study deliberately does not arrive at a final project description for restoration and/or relocation, it is not possible to develop a precise list of regulatory requirements. Instead, the most probable regulatory requirements are summarized for (1) complete or partial restoration of the Polaris wetland complex, (2) relocation of the athletic field, and (3) relocation of the campground.

1 INTRODUCTION

1.1 Purpose and Background

The Polaris + Pomin Project ("Project") is an effort to restore the historical Polaris Creek wetland complex at Robert Pomin Park in Tahoe City, California. The Project provides an opportunity to return geomorphic, ecological, and water quality functions to a near-shore wetland complex that has been degraded by historical land use activities, channelization, and placement of fill. Tahoe Regional Planning Agency (TRPA) land use mapping for the north shore of Lake Tahoe shows that the vast majority of the shoreline is residential, which has led to creeks being confined along narrow corridors as they empty into Lake Tahoe (Figure 1). This is contrary to the natural, undisturbed condition of many lake tributaries which historically had wide marsh or delta environments at their mouths; these features are significant because they support diverse communities of wildlife and act as "natural filters" by modulating fine sediment and nutrient loads to Lake Tahoe. The Project site presents a unique opportunity to restore natural filtration qualities, as well as habitat, to the Polaris wetland complex because of its location and the fact that the property is owned by various public agencies. Therefore, restoration activities are minimally constrained by private property boundaries.

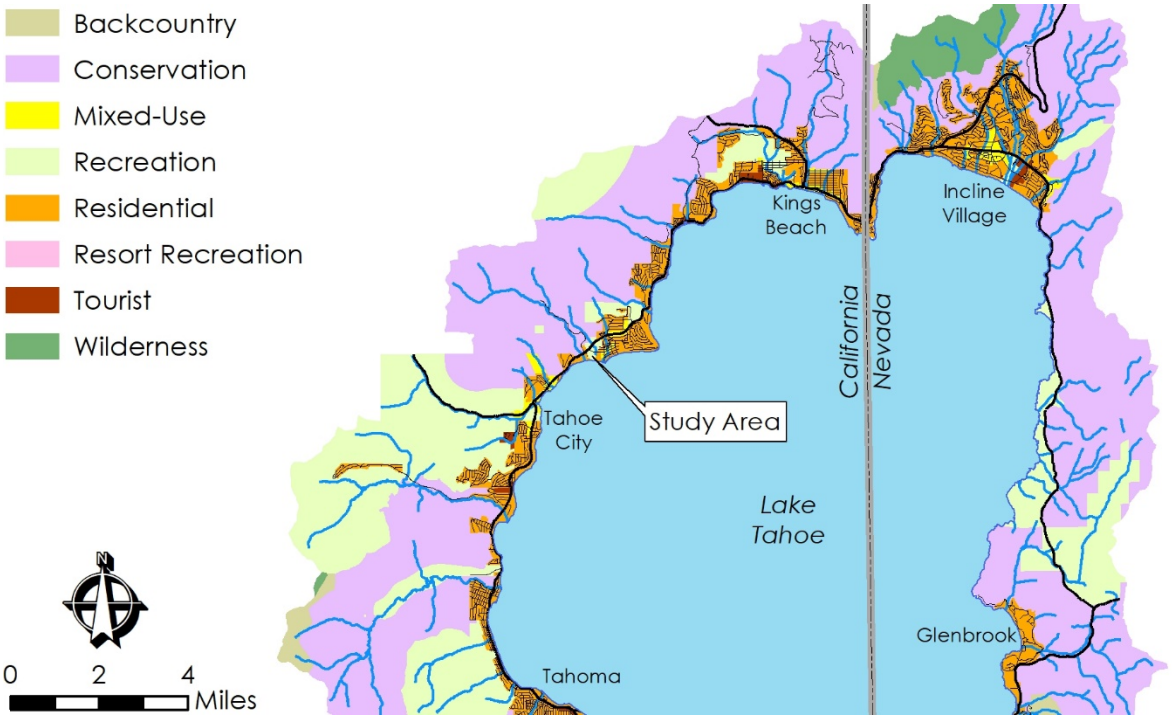

Figure 1. TRPA Land Use Mapping. Most of the shoreline of North Lake Tahoe is residential which limits opportunities for restoring natural systems at the mouths of tributaries to the lake.

Although there is potential for restoration within the confines of publicly owned land, achieving the maximum potential for restoration would mean relocating or reconfiguring certain recreation facilities within the study area of the Project. As such, to address the question of restoration feasibility, the question of relocation feasibility must also be addressed. In doing so, it is important to not only recognize what the existing facilities are that would be impacted, but also the values the community places on the facilities. Public engagement is necessary to understand the latter, and must be weighted equally alongside objective technical information on the existing facilities to identify viable relocation sites.

Restoration of the Polaris Creek wetland complex is identified as a priority project by TRPA's Environmental Improvement Program (EIP), which is the principal planning effort in the Lake Tahoe Basin to protect and improve natural and recreational resources. Improving the environmental quality of the Lake Tahoe Basin is a massive, multi-faceted effort, and the EIP provides a mechanism to track and coordinate hundreds of different projects undertaken by various federal, state, and local agencies and the private sector.

The feasibility study for the Polaris + Pomin Project was led by Tahoe Resource Conservation District (Tahoe RCD), a non-regulatory, grant-funded, local agency whose objective is to promote conservation by providing leadership for complex, multi-stakeholder projects. Using Proposition 1 grant funds obtained and administered by the California Tahoe Conservancy, Tahoe RCD contracted with a Consultant Team—professionals in the fields of civil engineering, geomorphology, hydrology, biology, planning, permitting, and public outreach—to complete technical backgrounding and author the feasibility study document. To guide the development of the feasibility study, Tahoe RCD compiled an "Advisory Group" of stakeholders consisting of public landowners and resource managers. The Advisory Group includes the Tahoe City Public Utility District (TCPUD) and California State Parks (CSP), both of which own and manage portions of the restoration site. The California Tahoe Conservancy (CTC) administered the funding for the study and participated on the Advisory Group to apply their mission of leading efforts to restore and enhance natural and recreational resources of the Lake Tahoe Basin. Lastly, Placer County participated on the Advisory Group for continuity with their previous restoration efforts in the area (i.e. the Lake Forest Erosion Control Project), to help coordinate the Project with other planning initiatives underway for the north shore of Lake Tahoe, and as the landowner of potential recreation relocation sites.

This feasibility study represents the first phase of a multi-year process to restore ecological function to the Polaris wetland complex, and attempts to answer the question of "what

is possible?" in terms of restoration. For restoration plans that would require relocation of existing facilities, the relocation sites strive to maintain an equivalent (or improved) level-of-service to the community. Multiple alternatives for restoration and relocation are presented, however, identifying a preferred alternative is not an objective of this study. Selection of a preferred alternative is reserved for the second phase of planning, and will require further technical study, coordination with the Advisory Group and other stakeholders, environmental documentation, and additional public outreach.

1.2 Project Goals and Objectives

The conceptual restoration designs focus on the following goals and objectives. The goals are meant to define what the project is trying to achieve, whereas the objectives are specific strategies or actions for achieving the project goals.

Goals:

- Restore Stream Environment Zone (SEZ) area and functions to the Polaris Creek wetland complex
- Maintain—or ideally, improve—recreation resources for the North Lake Tahoe community

Objectives:

- Restore historical wetland areas, channels, and flow patterns that have been impacted by fill placement or other anthropogenic disturbances
- Enhance sediment retention and nutrient uptake to improve water quality and Lake clarity
- Provide suitable habitat to promote native vegetation communities and wildlife habitat diversity
- Promote natural soil productivity and nutrient cycling, including decompaction of disturbed soils
- Expand wildlife movement corridors
- Protect cultural and historic resources
- Allow for possible future re-routing of Burton Creek through the Polaris Creek wetland complex to further achieve goals related to sediment retention
- Minimize post-construction costs by designing the restoration features to be self-maintaining.

- Design restoration features as modular elements such that elements can be mixed and matched to allow phased implementation
- Identify relocation sites for athletic fields that would improve recreation amenities for the community by providing separate baseball and soccer fields at a low-elevation site that is usable early in the spring.
- Identify relocation sites for the campground that would provide at least 20 campsites and can be accessed by the Lake Tahoe Water Trail users.

2 WORK COMPLETED

2.1 Available Data and Reports Reviewed

The following reports and data were reviewed:

- Lake Forest Erosion Control Project (EIP Projects #10061 and #10063) Existing Conditions Analysis Memoranda and Preferred Alternative Report (Wood Rodgers, 2004; Wood Rodgers, 2006; Wood Rodgers, 2007)
- Final Environmental Assessment, Section 108 Lake Forest Erosion Control Project – Area B, (USACE, 2009)
- Tahoe Environmental Research Center (TERC) Hatchery Wetland Restoration Hydrology and Soils Assessment (Shaw, 2008)
- Surface water and groundwater monitoring data for partial Water Years 2007 and 2008 (Heyvaert, 2008)
- Stormwater Characterization from the Lake Forest Project Area (Rios and others, 2008)
- Geologic mapping for the north Lake Tahoe region (Sylvester and others, 2012)
- Stream Environment Zone (SEZ) background information and site-specific reports (SIG, 2015; TRPA, 2019)
- Historical aerial photos, 1939 through 2018 (USGS, various years; Salix, 2019)
- GIS mapping and as-built drawings of water and sewer infrastructure (provided by TCPUD)
- LiDAR topographic mapping for the Polaris Creek watershed (TRPA, 2010; Placer County, 2012)

An annotated bibliography is provided in Appendix D that summarizes these and other documents that are directly pertinent to the Study Area.

2.2 Completed Studies

To further improve our understanding of site-specific issues, the following studies and work have been completed to support this feasibility study:

- Cultural Resource Inventory: Archaeological Literature Review and Native American Consultation (Lindström, 2019)
- Biological and Wetland Resources Assessment (Salix, 2019)

- Summary of Public Input for the Polaris + Pomin Project (Zephyr Collaboration, 2019)
- Streamflow gaging at the downstream end of the Polaris wetland complex during Water Year 2019
- Field observations over a range of hydrologic conditions

2.3 Conceptual Restoration Design Development

Conceptual designs for restoration of the Polaris wetland complex are presented to restore Stream Environment Zone (SEZ) functions. The designs are based on an understanding of the disturbance history and existing impairments to the Project site. As such, contextual background information on the existing conditions at the Project site is summarized to help readers understand site-specific constraints and opportunities, as well as the scientific reasoning to link the conceptual designs to the project goals and objectives.

The conceptual designs are subdivided in terms of "design elements". The elements are designed to be compatible with one another so they may be combined during future project phases to form a preferred alternative. Due to the large number of possible element pairings, a limited number of configurations are presented to help the reader visualize a comprehensive restoration project, however, it is important to note that elements can be combined many other ways.

The conceptual designs presented herein are suitable for presentation to and discussion among landowners, project stakeholders, and the public; however, this feasibility study should always accompany the conceptual designs when they are distributed.

2.4 Relocation Study for Existing Facilities

The Study Area for the feasibility study (Figure 2) encompasses several existing facilities including: the U.C. Davis Tahoe City Field Station, Lake Forest Campground, Robert Pomin Park, Lake Forest Boat Ramp, a California State Parks public beach, and associated roads, public restrooms, and parking areas. All of the existing facilities have encroached on the historical Polaris wetland complex to varying degrees, and to completely restore the wetland complex to its historical condition would require a significant effort to relocate all of the existing facilities. This feasibility study acknowledges that while it is possible to relocate all of the facilities, it is not a reasonable approach. Relocation of the U.C. Davis Tahoe City Field Station and Lake Forest Boat Ramp were considered not

feasible due to their high level of service to the community and the extreme difficulties in identifying comparable sites for their relocation. Pomin Park and the Lake Forest Campground—although they also provide a high level of service to the community—were considered to have higher potential for relocation because there are fewer constraints on identifying comparable relocation sites. As such, this feasibility study explores restoration potential associated with relocating (or reconfiguring) Pomin Park and the Lake Forest Campground, as well as restoration opportunities which would not require relocation of existing facilities (for instance, the east arm of Star Harbor which is owned by CSP and is currently undeveloped).

The relocation portion of the feasibility study does not draw conclusions on if or where Pomin Park and/or Lake Forest Campground should be relocated; rather, it only provides preliminary technical screening on the constraints and opportunities associated with potential relocation sites to help guide future decision making. The relocation analysis incorporates input from the Advisory Group member agencies, as well as the North Lake Tahoe community, to identify the best-possible solutions. Ongoing coordination with these groups is needed if the relocation effort is pursued.

2.5 Public Outreach

Outreach to engage community members regarding the Pomin Park + Polaris Creek Project was completed in September and November 2019. Outreach efforts included informal "intercept surveys" conducted during a fall youth sporting event at Pomin Park, online surveys, and a community workshop. The Project was advertised in local newspapers, agency newsletters, agency websites and social media platforms to encourage community involvement. The Consultant Team also reached out directly to athletic field user groups, as well as to main contacts for local homeowner associations to invite participation.

Results from the public outreach effort are presented within Section 4 and Section 5 of this report, and a comprehensive summary of public input is included in Appendix C.

3 EXISTING CONDITIONS

3.1 Location

The Polaris-Pomin wetland complex is located on the north shore of Lake Tahoe, immediately southwest of the intersection of State Route 28 and Lake Forest Road, on a gently sloping alluvial fan at the edge of the Polaris and Burton Creeks wetland complex (see Figure 2). Elevations on the site range from approximately 6,225 feet at Lake Tahoe to around 6,260 feet near State Route 28. The property is bounded on the north by State Route 28 and Lake Forest Road, on the east by the U.S. Coast Guard Lake Tahoe Station, on the south by Lake Tahoe, and on the west by Star Harbor.

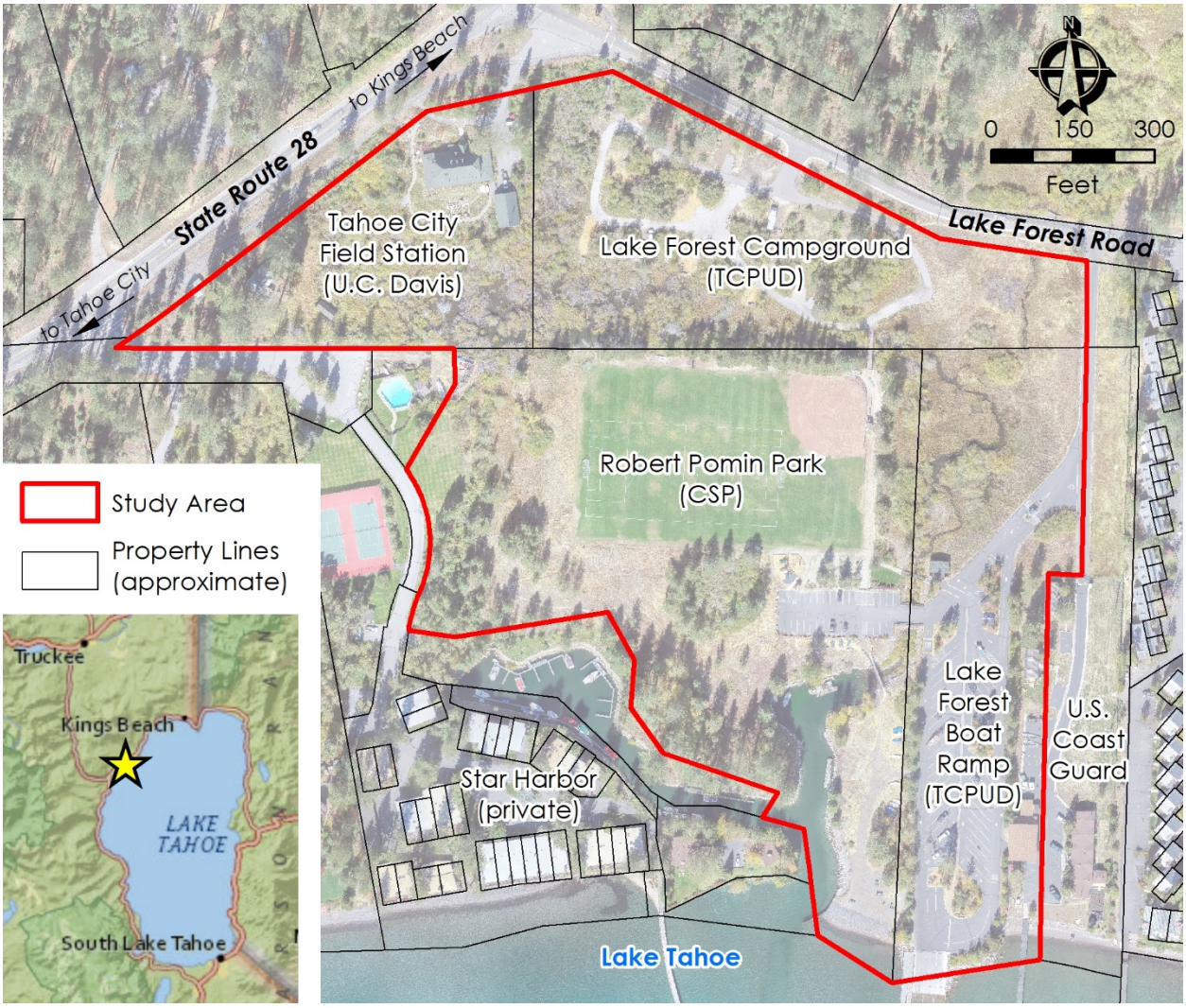

Figure 2. Project Location and Study Area. Landowners shown in parentheses for facilities within the Study Area.

There are four main features within the study area. The U.C. Davis Tahoe City Field Station (also known as the "Historic Fish Hatchery") is located in the northwest corner, and consists of a laboratory, an interpretive trail, and researcher housing. The Lake Forest Campground is located in the northeast corner; the campground is owned and operated by the TCPUD and consists of 20 campsites. The Lake Forest Boat Ramp is located along the western edge of the study area; the boat ramp is also owned and operated by the TCPUD and consists of boat trailer parking, a pier, restrooms, and boat launch ramp. Lastly, Robert Pomin Park constitutes the remainder of the study area, and consists of athletic fields, a playground, picnic tables, and parking. Pomin Park is owned by CSP and is operated and maintained by TCPUD. Although not considered part of Pomin Park, the CSP parcel also includes the east arm of Star Harbor and a small public beach.

3.2 Hydrologic Setting

3.2.1 Climate

The climate of the area is typical of the Sierra Nevada region, with cold snowy winters and cool summers, although seasonal precipitation patterns are largely influenced by the Mediterranean climate of central and coastal California. Most precipitation falls between October and April, with occasional summer thundershowers. Throughout the Lake Tahoe basin peak annual flows are often dominated by springtime snowmelt, and typically occur between March and June with the occasional early winter peak from a rain-on-snow event. Mean annual precipitation in Tahoe City is approximately 37 inches[1].

3.2.2 Surface Water

Surface water in the Polaris Creek wetland complex originates from three primary sources: a system of spring-fed channels from the northwest, Polaris Creek from the north, and Lake Forest Creek from the northeast. Historical aerial photos suggest that Burton Creek once was a third surface water source and ran through the wetland complex near the location of the athletic fields; this topic is discussed in further detail in the Historical Conditions section. Figure 3 shows an elevation map of the watersheds tributary to the Study Area, and Figure 4 shows a detailed view of the primary watercourses within the Study Area.

[1] As recorded by the Tahoe City Cross County NRCS SNOTEL station located 2 miles southwest of the Project site, period of record 1981 to present.

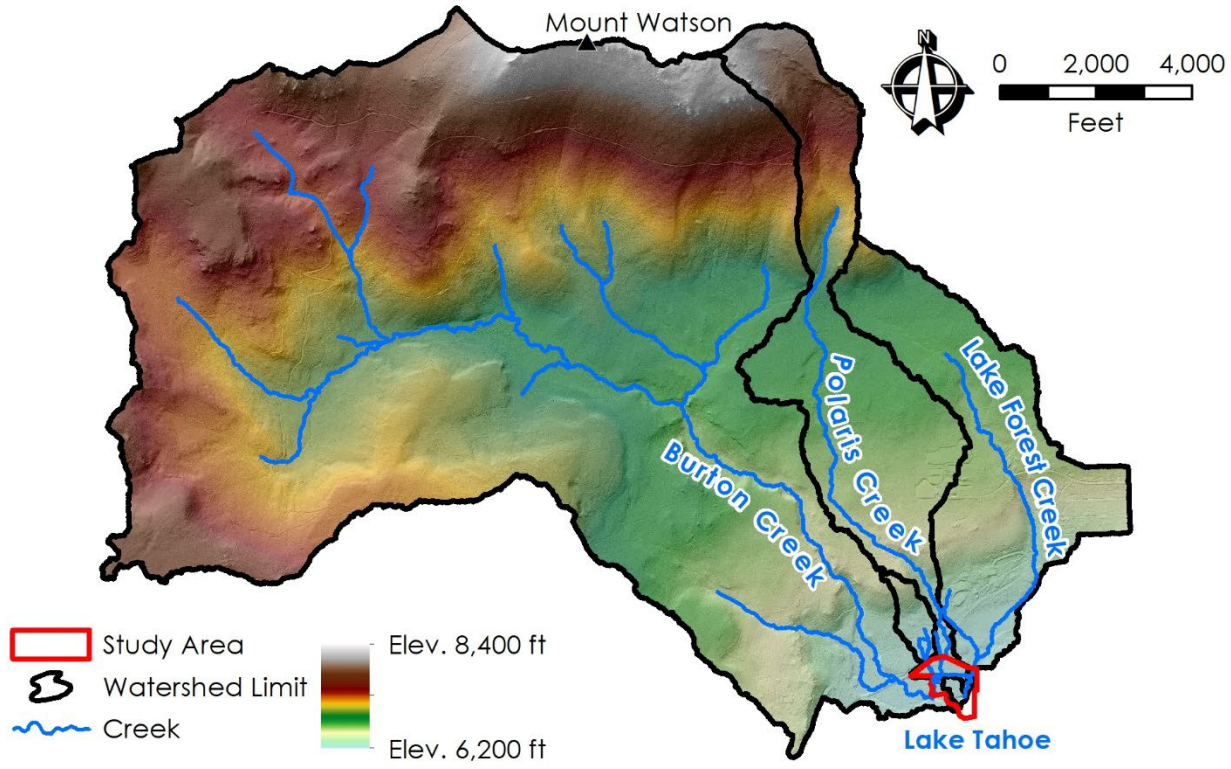

Figure 3. Watersheds tributary to the Study Area.

The "Spring Channel" is fed by several springs on both sides of State Route 28. The Spring Channel once had an inline pond adjacent to the Historic Fish Hatchery building that is now operated as the U.C. Davis Tahoe City Field Station. Hatchery operations ceased in 1956 (Lindström, 2019) and a restoration project was completed by U.C. Davis in 2010 to restore wetland functions to the pond area. Roughly 300 feet downstream of the Tahoe City Field Station building the Spring Channel is intercepted by a ditch running east-west that conveys flow toward Lake Forest Creek. High flows can overtop high ground at the upstream end of the "High Flow Bypass" and continue into the "Star Harbor Channel." This flow pattern bears resemblance to the pre-anthropogenic disturbance condition, however, the High Flow Bypass is rarely active because (1) the small watershed area for the Spring Channel combined with the inherent low-response character of the springs precludes high flows from occurring on a regular basis, and (2) upstream end of the High Flow Bypass has been raised from beaver activity. Although there is not a persistent surface water source for the High Flow Bypass, closed depressions and low points in and near the channel frequently hold small areas of pooled water due to shallow groundwater conditions and/or seepage from the Spring Channel.

A one-year monitoring program was completed by Field Station researchers which included streamflow monitoring on the Spring Channel from December 2006 to

September 2008 (Heyvaert, 2008). The Spring Channel has a relatively small watershed area, estimated as 25 acres, and the highest flow rate observed was commensurately small, recorded as 3.0 cfs during the spring snowmelt period in May 2008. Baseflow rates during the summer and early fall months ranged from 0.035 to 0.2 cfs.

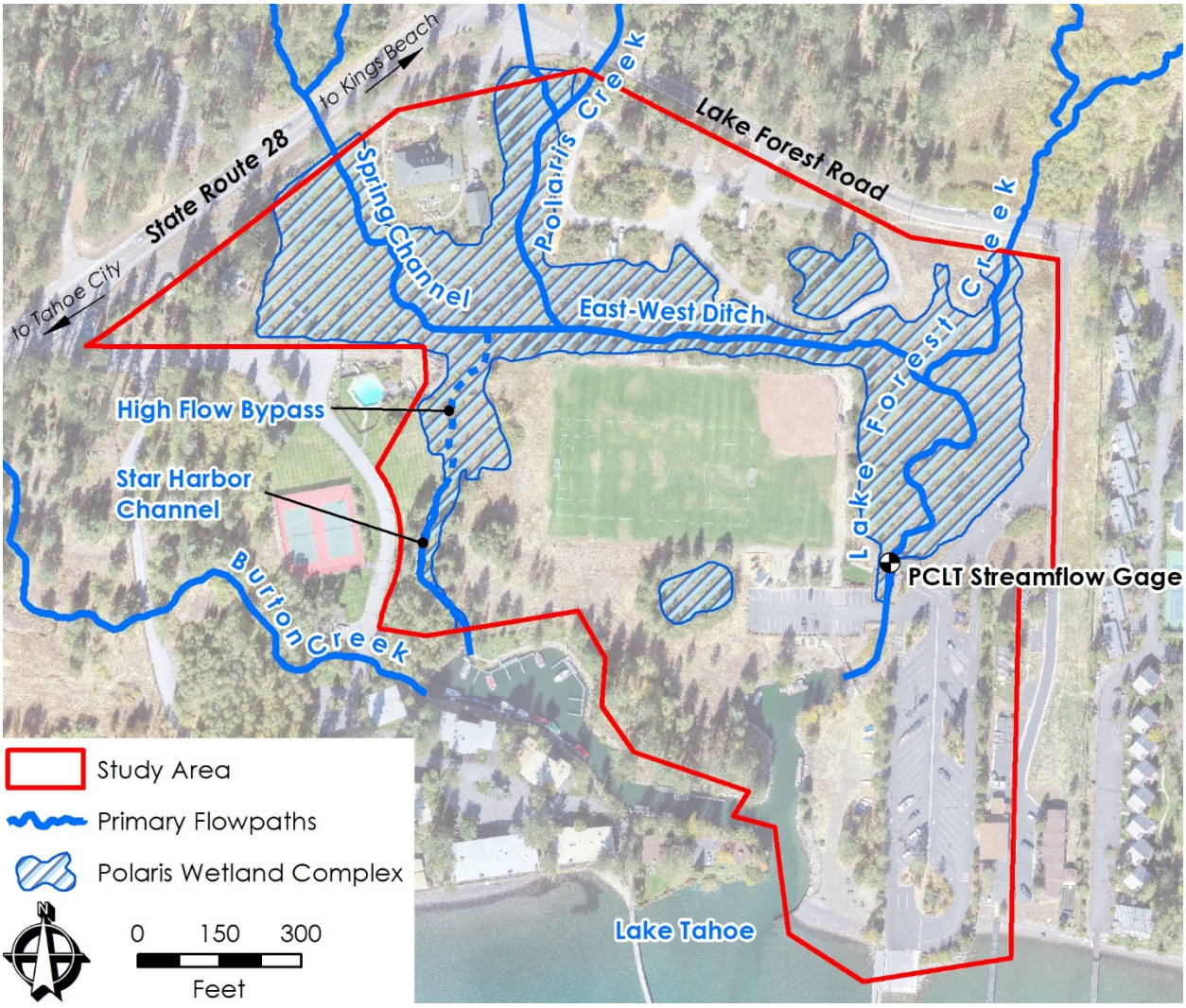

Figure 4. Primary Surface Water Flowpaths. The remnant portions of the Polaris wetland complex are defined as the riparian and wet meadow habitat areas mapped by Salix (2019).

Polaris Creek has a watershed area of roughly 530 acres[2] (measured at the crossing with State Route 28) and extends to the rim of the Tahoe basin near the southeast flank of Mount Watson. A small channel joins Polaris Creek just downstream of Lake Forest Road and is fed by springs on the north side of State Route 28. The springs are situated near the contact between upland volcanic flows and alluvial soils to the north and lake clay deposits to the south. Groundwater can percolate through the fractured volcanic bedrock and coarse alluvial fan sediments and forms springs where it is directed toward the surface upon encountering the clays (Shaw, 2008). Similar to the Spring Channel, the natural watercourse for Polaris Creek is interrupted by the east-west ditch that conveys flow toward Lake Forest Creek. No monitoring data was available to quantify flow rates on Polaris Creek, however, flow was present in the channel during all field visits conducted for this study, likely due to the groundwater discharge component.

Lake Forest Creek flows through the east portion of the Study Area and discharges to Lake Tahoe. Lake Forest Creek between Lake Forest Road and Lake Tahoe was once contained in a series of linear channels and culverts, however, the channel was realigned as part of the Lake Forest Erosion Control Project, Area B (Wood Rodgers, 2007), constructed in 2010. Streamflow and water quality monitoring data for Lake Forest Creek prior to the Lake Forest Erosion Control Project is summarized by Rios and others (2008), however, the data are not directly relevant to current conditions because they precede the rerouting of Lake Forest Creek to its current alignment through the Polaris Creek wetland complex. Although there are springs within the Lake Forest Creek watershed, Lake Forest Creek upstream of the confluence with the east-west ditch is ephemeral and goes dry in the late summer or early fall in most years. As such, groundwater discharge is interpreted to make up a smaller percent of total streamflow compared to Polaris Creek and the Spring Channel. Downstream of the confluence with the east-west ditch, Lake Forest Creek flows perennially due to contributions from Polaris Creek and the Spring Channels. It is worth noting that Burton Creek also goes dry in the late summer or early fall of most years. This is significant because although the watersheds for Polaris Creek

[2] Watershed boundaries and drainage patterns for this study were estimated from LiDAR mapping and limited field verification was completed. Portions of the Polaris Creek, Lake Forest Creek, and Burton Creek watersheds are very flat making it difficult for the boundaries to be discerned by the digital mapping. Watershed boundaries and drainage patterns may have also been altered by historical land use activities. This is likely why past studies have yielded vastly different estimates for the Polaris Creek watershed area; for example, Wood Rodgers (2004) reported the watershed area as roughly 1,000 acres, prior to the availability of the LiDAR-based high-resolution topographic data. Along similar lines, 2NDNATURE (2017) showed Polaris Creek entering Lake Forest Creek approximately 200 feet upstream of Lake Forest Road; the discrepancy between the drainage pattern for Polaris Creek is due to vague channel definition just upstream of State Route 28.

and Burton Creek constitute most of the contributing area for the undisturbed Polaris Creek wetland complex (i.e. before Burton Creek was realigned), surface water during the driest parts of the year is supplied from springs. This suggests that flow from springs is the most important part of the hydrologic support for the wetland complex in terms of flow duration, frequency, aquatic habitat, and resiliency of this particular system to changes in climate and timing of surface runoff. Monitoring data for Water Year 2019 for Lake Forest Creek was completed as part of this study and is presented in the following section.

The Star Harbor Channel drains the southwest portion of the Study Area. The contributing area for the Star Harbor Channel is only a few acres, however, surface water was observed during all site visits between October 2018 and November 2019. In all cases, streamflow was very low (less than 0.1 cfs) and the primary hydrologic support is likely groundwater discharge and/or seepage from other portions of the wetland complex. The lower half of the Star Harbor Channel includes several constructed boulder steps to support the steep gradient between Pomin Park and Star Harbor.

3.2.3 Surface Water Monitoring Program

A hydrologic monitoring program was implemented as part of this study to quantify flow rates at the downstream end of the Polaris wetland complex over all seasons. A continuous-recording streamflow gaging station was established on Lake Forest Creek beneath the pedestrian bridge adjacent to the restrooms (see Figure 4). The gage was instrumented with water level and temperature recorders, programmed to measure and record readings every 15 minutes. The stream-gaging practices followed procedures used by the USGS, as outlined by Carter and Davidian (1968). Hydrologists measured flow over a range of different water depths. Based on our periodic site visits, staff plate readings, and streamflow measurements, an empirical stage-to-discharge relationship was created, also referred to as a stage-discharge "rating curve." The rating curve is then used to convert the continuous-logging record of stage to flow. As with all open-channel gaging of natural streams, a higher degree of uncertainty remains at high flows and during periods of ice formation, despite efforts to be as precise as possible, as discussed in more detail by Rantz (1982). In particular, the rating curve was extrapolated to estimate flow rates above the highest streamflow measurement. Several days in February 2019 were also excluded from the record due to ice formation; nearby USGS streamflow gages were affected by ice during the same time so there was no reliable basis to fill the ice-affected portions of the record with surrogate data.

A hydrograph of daily-average flow on Lake Forest Creek above Lake Tahoe during Water Year 2019 is presented in Figure 5 and the observer log summarizing manual measurements is provided in Appendix E. Daily precipitation values are included to provide context on streamflow response to rain and snow events. The data show a hydrograph that is typical of a system dominated by groundwater discharge, with limited influences from surface runoff. A gradual rise in streamflow began at the onset of the wet season (mid-fall), and ended at the peak annual flow (30 cfs on April 27, 2019), coincident with the timing of peak snowmelt in the spring. From the spring through the summer months, the recession limb of the hydrograph mirrors the rate-of-change of the rising limb and reached baseflow levels of approximately 1 cfs around Labor Day. Within the rising and falling limbs of the hydrograph, precipitation events cause short-lived periods of high streamflow response, but overall, the data show the system to not being "flashy" due to the very gradual annual rise and fall of streamflow levels. For context, mean annual precipitation for Water Year 2019 measured at the Tahoe City Cross County NRCS SNOTEL station was 52 inches, or 140 percent of average.

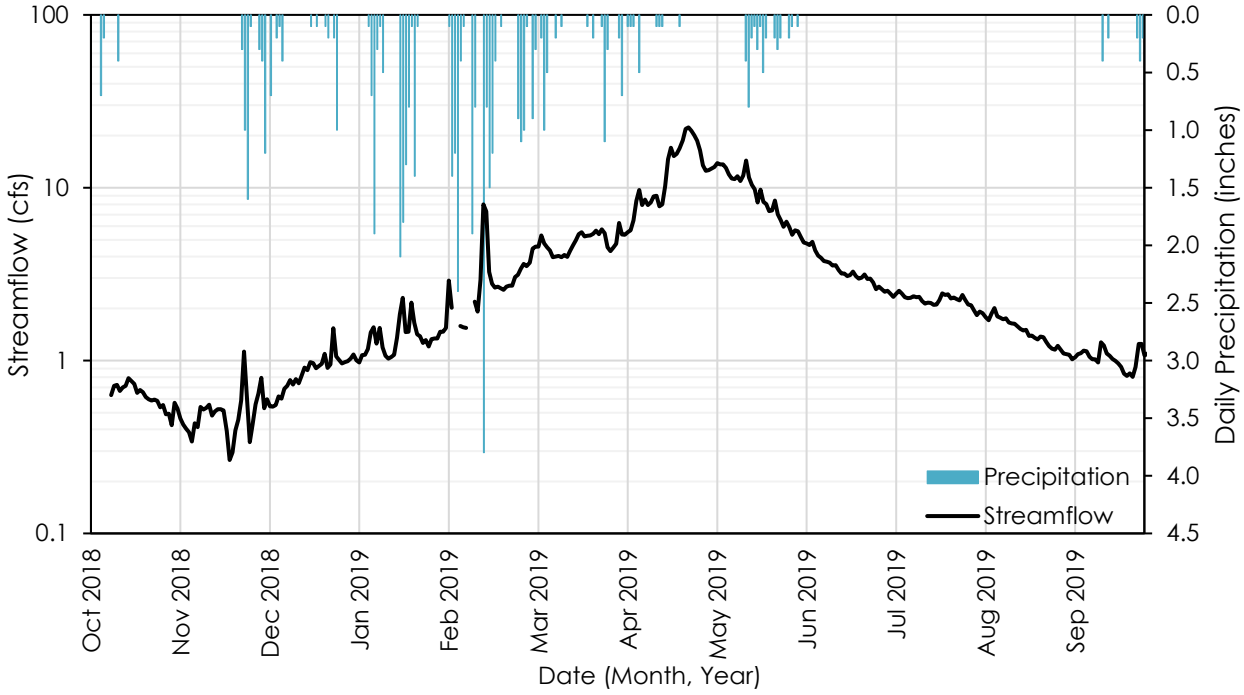

Figure 5. Daily average streamflow on Lake Forest Creek above Lake Tahoe, Water Year 2019. Gage was installed on October 8, 2018. Missing portions of the hydrograph in early February 2019 are due to ice effects. Precipitation is data is from the NRCS SNOTEL site at the Tahoe City Cross County Center.

3.2.4 GROUNDWATER

It is likely that the contrast in hydrologic properties between the upland permeable volcanic and alluvial soils to the north and the lacustrine and fringe wetland deposits at the project site are responsible for the numerous seeps, springs, and generally shallow groundwater conditions in the vicinity of the Study Area.

Heyvaert (2008) and Shaw (2008) observed ground water levels in monitoring wells in the vicinity of the historic hatchery building and campground. In general, groundwater levels varied as expected: rising slowly through the late winter and rapidly in the early spring to a maximum coinciding with peak snowmelt. After the snowmelt peak in early spring, groundwater levels fell steadily until June.

Groundwater gradients were observed by Heyvaert (2008) in the vicinity of the historic hatchery and campground to be generally from north to south, similar to the topographic surface, with the shallowest groundwater levels generally found near the transition between coarser alluvial soils (or artificial fill) and intact fine-grained wetland soils. Shaw (2008) identified upward vertical hydraulic gradients, suggesting confined aquifer conditions below shallow clays at the site and deeper groundwater upwelling and discharge.

Measurements of specific conductance also indicated multiple sources of water to be present on the site.[3] Specific conductance of ground water measured in deeper wells located in the west and south portion of the Hatchery property was regularly higher than shallow (3 to 5 feet deep) groundwater measured in a shallow piezometer and surface water emanating from the spring. The relatively low specific conductance of waters emanating from the spring are likely reflective of their origins as snowmelt waters and may further be an indication that spring water is relatively young, perhaps moving rapidly through the shallower alluvial deposits before discharging at the spring. The higher

[3]Specific conductance is a widely used measure of the ability of water to conduct electricity, which is a proxy for the concentration of total dissolved solids (or 'salinity') in the water. As water passes over and through the ground, ions are typically leached, thereby increasing the conductance of the water. Specific conductance can vary greatly with geology. In general, higher specific conductance values typically reflect longer residence times in the ground, movement through soils or geologic units which may have higher natural concentrations of salts, or evaporation and concentration of dissolved ions. High specific conductance values can also be derived from human or cultural sources that may be saltier than the stream. Lower specific conductance generally reflects runoff or recharge from direct rainfall, or limited residence time in the ground.

specific conductivity of the deeper ground waters is likely associated with longer flow paths and travel times.

3.3 Geology and Soils

Figure 6 illustrates geology of the site and surrounding area, as compiled by Sylvester and others (2012). The uppermost elevations to the north of the area are mapped as Pliocene andesite and basaltic andesite flows (map symbol: Pva), with the slightly younger Tahoe City trachyandesite and basalt flows (Pvta and Pvtb) to the west. Fine-grained lacustrine sediments are mapped along the perimeter of Lake Tahoe above the current lake elevation. These sediments were deposited during higher lake level stands associated with various glaciation episodes and damming of the lake outlet by glaciers and glacial deposits. Burton Creek and other streams flow down across the generally south-facing volcanics, and deposit Quaternary-aged alluvial fan sediments (Q) atop the lake deposits in the transition from the steeper volcanic slopes to the gentler slopes of the former lake bottom. The Polaris wetland complex is located at the distal edge of the Burton Creek alluvial fan.

Soils are generally derived from the underlying geology and historical hydrologic regimes. Watah peat is mapped underlying the Polaris-Pomin wetland complex, and is described as a very deep, very poorly drained soil that formed in organic material over alluvium (USDA NRCS, 2019). Steeper slopes immediately adjacent to the east and west of the site are mapped as Kings Beach stony sandy loam, 2 to 15% slopes, which typically forms in alluvium or colluvium derived from andesite over lacustrine deposits (USDA NRCS, 2019). Soils on steeper slopes derived in bedrock to the north are mapped as part of the Tahoma-Jorge complex, a well-drained cobbly sandy loam developed over residium weathered from andesite.

The Tahoma-Jorge complex and Kings Beach series are described as having relatively high infiltration rates with relatively slow runoff, highlighting their suitability for and function as local ground-water recharge units. Conversely, the Watah peat is noted for year-round shallow water table conditions, ranging from 0.5 to 3 feet below the ground surface, with very low permeability and infiltration rates.

Monitoring well logs from the site (Gantt and Pettersen, 1999) indicate clays or silty clays typically within a few feet of the ground surface. The uppermost soils typically consist of sand or silty sand, perhaps overbank flood deposits, or simply artificial fill associated with the construction of the hatchery building and campground.

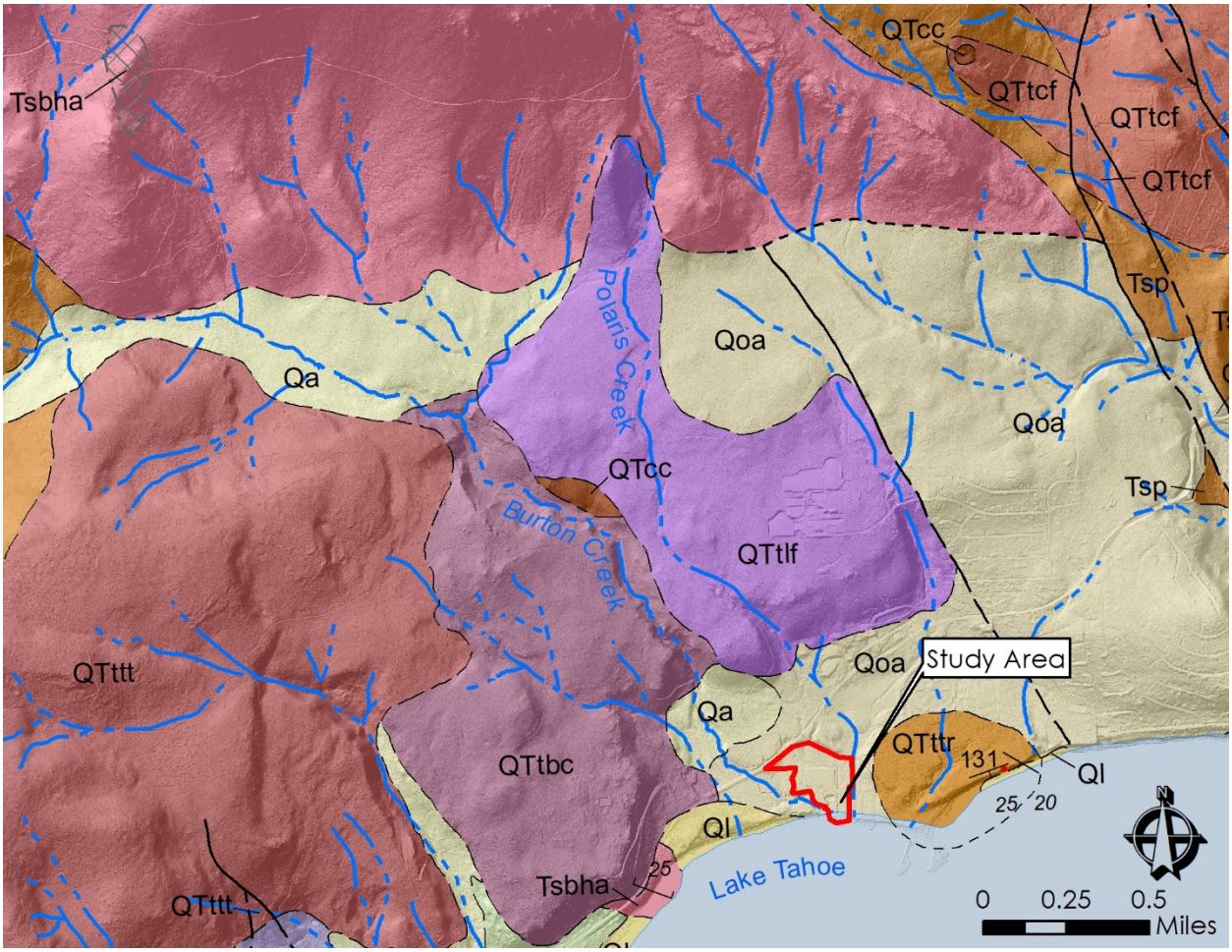

Figure 6. Geologic Map of watersheds contributing to the Study Area (Sylvester and others, 2012). Units shown on the map are: Qa – recent alluvium (Holocene); Qoa – older alluvium (Holocene and Pleistocene); Ql – lacustrine deposits (Holocene); QTcc – cinder cone deposits; QTttt – Trachyandesite of Tahoe City; QTtbc – olivine basalt of Burton Creek; QTtlf – olivine basalt of Lake Forest; Tsbha – biotite-hornblende andesite lava domes and flows; Tsp – volcaniclastic deposits: andesitic tuff, lapilli tuff, and tuff breccia.

3.4 Geomorphic Setting

Channel morphology of streams within the Study Area is largely related to its location at the distal edge of an alluvial fan. Channel form of alluvial fans is inherently complex due to the multiple distributary channels and diffuse flow patterns, and this quality is compounded at the Study Area because it marks the confluence of three tributaries to Lake Tahoe and several other smaller spring-fed channels. Alluvial fans are natural sediment storage features that also lead to diffuse flow patterns. These processes and form have led the Polaris wetland complex to be a major sediment deposition zone, providing natural filtration of sediment and nutrients derived from the steep hillsides in a marsh-like environment before discharging to Lake Tahoe.

Over time, however, channel form has been simplified as various development projects and infrastructure has impinged upon historical channel corridors. Furthermore, some channels have been realigned, shortening their length and making them more efficient in transporting sediment to Lake Tahoe. There is even evidence that the mouth of the Polaris wetland complex (i.e. where surface water enters Lake Tahoe) has be relocated from its historical location (Figure 7).

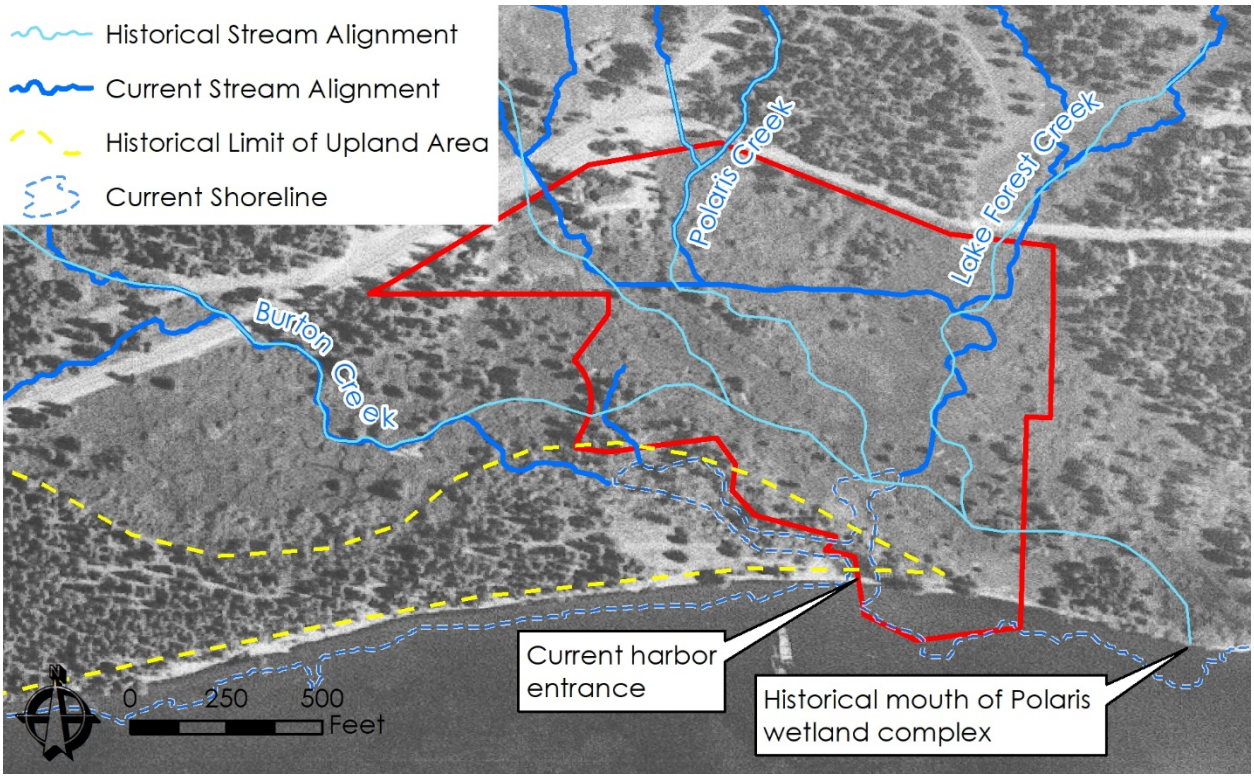

Figure 7. Historical and current channel patterns of the Polaris wetland complex. Aerial photo is from 1953 and shows the Study Area in a less disturbed state than current conditions. Locations of all historical features are inferred from the aerial photo and no other sources were available to confirm the locations. Some of the differences between the 1953 and current shoreline are due to different lake levels.

Review of aerial photographs provides the best representation of undisturbed channel conditions. Even though channels were already impacted by roadways visible in the earliest aerial photograph from 1939, the photos suggest that the historical channels followed a more circuitous course before emptying into Lake Tahoe. The main reason for the longer flow paths prior to the 1950s appears to be a barrier dune or upland terrace which deflected channels to the east. Apart from the visual signature of an upland in the photo (upland vegetation and areas of bare ground) topographic mapping shows the elevation of the area to be 5 to 10 feet higher than the terrain to the north. Lastly, the geologic mapping by Sylvester and others (2012; see Figure 6) indicate the upland

area is made up of lacustrine deposits whereas the Burton Creek corridor to the north is mapped as alluvial deposits. Although multiple lines of evidence suggest that Burton Creek entered Lake Tahoe to the east of the Study Area, the 1940 USGS Truckee Quadrangle (1:125,000 scale) showed Burton Creek entering the lake roughly 500 feet to the west of the Study Area. The 1940 map and/or the interpretation of aerial photographs indicate that the mouth of Burton Creek has been relocated multiple times, and the true location(s) of the historical mouth of the Polaris wetland complex is uncertain without other lines of evidence. Regardless, it is clear that channels and channel mouths have been manipulated within the Study Area over time, which has degraded their functional value.

The primary geomorphic impact of shortening channel length is that there are fewer opportunities to attenuate sediment transport before reaching Lake Tahoe. Shorter length also means the slope must become steeper as channels approach Lake Tahoe, which is contrary to the gradual flattening of slope in the downstream direction that typically occurs in delta and alluvial fan environments. If the location of the historical mouth of the Polaris wetland complex in Figure 7 is accurate, Burton Creek is more than 1,700 feet shorter than pre-1950s conditions. Burton Creek now bypasses the Polaris wetland complex and enters the west arm of Star Harbor via an engineered waterfall roughly 10 feet high. In the case of Lake Forest Creek/Polaris Creek, the length reduction is on the order of 700 feet and the steep approach to Lake Tahoe is managed via a steep, boulder-lined channel. This "short circuiting" of the Polaris wetland complex has also likely contributed to large sediment deposits that have periodically impaired recreation access at Star Harbor; approximately 126 cubic yards of material was dredged in 2004 (CEQAnet, 2004) and approximately 628 cubic yards in 2015 (LRWQCB, 2015).

Restoration efforts within the Study Area and its vicinity have attempted to restore geomorphic function by reintroducing sinuosity and expanding depositional surfaces (Wood Rodgers, 2007), and reconstructing wetlands (Shaw, 2008). While any future effort to further enhance geomorphic processes to the Polaris wetland complex will promote sedimentation and enhance vegetation and habitat by creating shallower groundwater conditions, restoring pre-1950s functions is improbable without relocating important pieces of infrastructure that the community has come to depend on.

Rerouting Burton Creek to follow its historical alignment through the Polaris wetland complex also has high potential to promote sedimentation and habitat, but would require working outside of the Study Area and coordination with the Star Harbor HOA

and other private landowners, and is therefore not currently being considered as a component of this project.

3.5 Stream Environment Zones (SEZ)

The TRPA defines an SEZ as "Generally an area that owes its biological and physical characteristics to the presence of surface or ground water." There are various types of SEZ designations with each type based on site characteristics for soils, hydrology, geomorphology, and vegetation. Each type of SEZ is linked to a set of desired conditions, values, functions, and processes that can be used to guide management approaches across multiple regulatory agencies.

The SEZ mapping for the Study Area is shown in Figure 8. Although significant improvements have been made in the most recent iteration of SEZ mapping (SIG, 2015), field mapping is still ultimately required to establish boundaries in detail at the site scale. For this discussion, the precise boundaries between SEZ types are less important than understanding current ecological function of the SEZ types present at the Study Area. TRPA (2019) advanced the SIG (2015) study—which focused on improving the mapping of SEZ spatial distributions—by completing detailed field studies to assign scores to SEZs based on their functional quality. Six sites in the Lake Forest area were evaluated, two of which fall within the Study Area. Both sites received overall scores of "good" with the lowest scores in the categories for conifer encroachment and habitat fragmentation.

The SEZ mapping for the Study Area will need to be updated to support the environmental review and permitting phase of the restoration project. The mapping completed by Salix (2019) for this study provides a solid basis to begin updating the SEZ mapping, but additional field work will be required to develop mapping that is consistent with the criteria for SEZ types outlined by SIG (2015) and updated functions described by TRPA (2019).

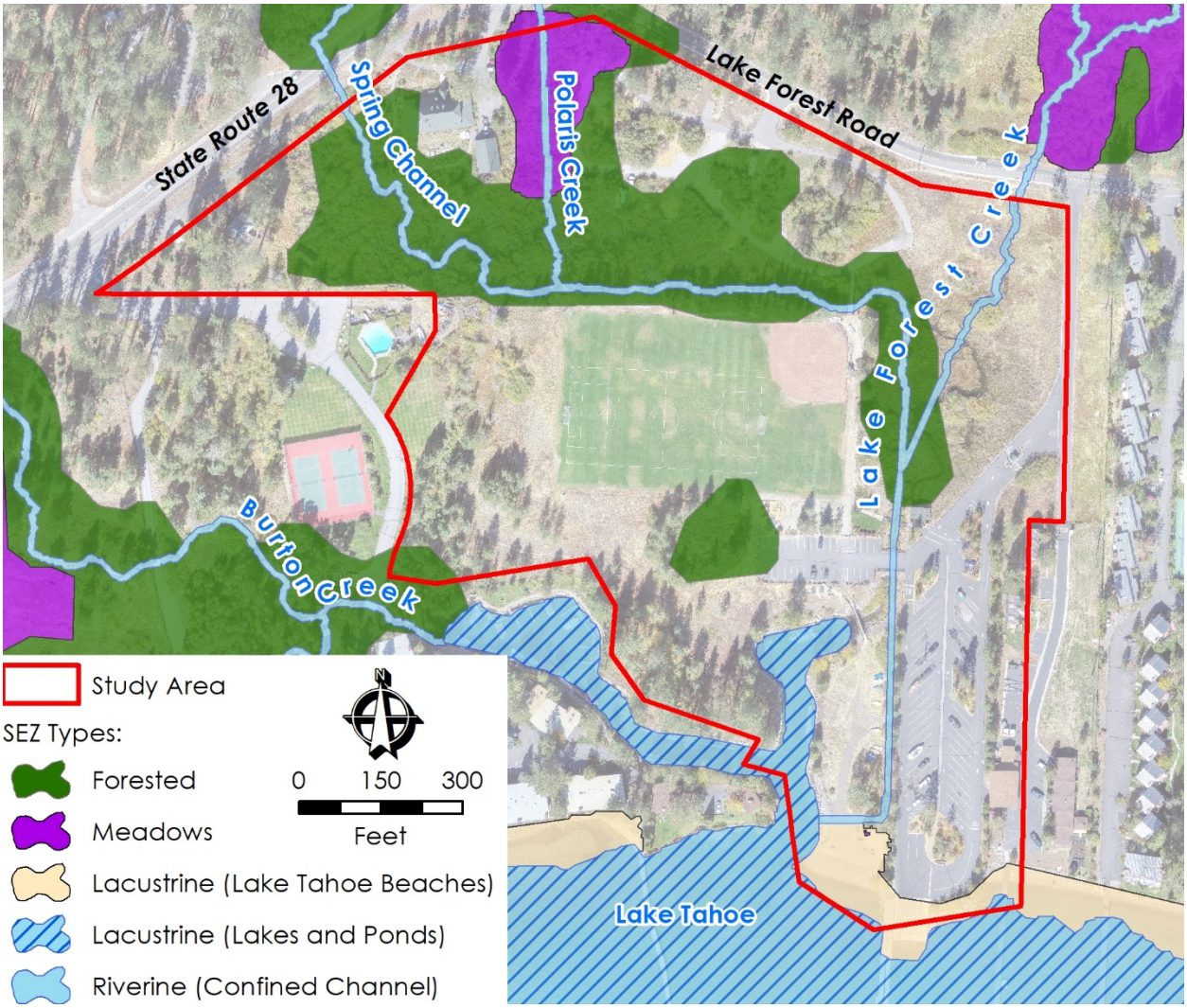

Figure 8. SEZ mapping per SIG (2015) for the Study Area.

3.6 Beaver

Beaver activity in the Polaris wetland complex was noted more than 10 years ago by Shaw (2008) and is likely to have been part of the landscape for much longer. Roughly 10 active or abandoned beaver dams were observed during field reconnaissance in summer 2019 (Figure 9). There have been efforts to limit flooding caused by beaver activity; a "beaver deceiver" device that limits ponding depths has been installed on one of the dams on the north side of the athletic field. Beaver activity is significant in controlling water levels and inundation extents which have been a nuisance for the campground and the Tahoe City Field Station because several sites are unusable due to flooding. The same impacts from beaver activity can benefit fluvial systems by raising groundwater levels, reconnecting incised channels to high-flow swales and floodplains, and encouraging sedimentation. For these reasons, fluvial restoration projects sometimes

include design elements to encourage beaver colonization (e.g. Pollock and others, 2012; Pollock and others, 2014; Castro and others, 2015); nevertheless, their behavior is unpredictable so there is always uncertainty surrounding if and how beaver will affect systems over the long-term.

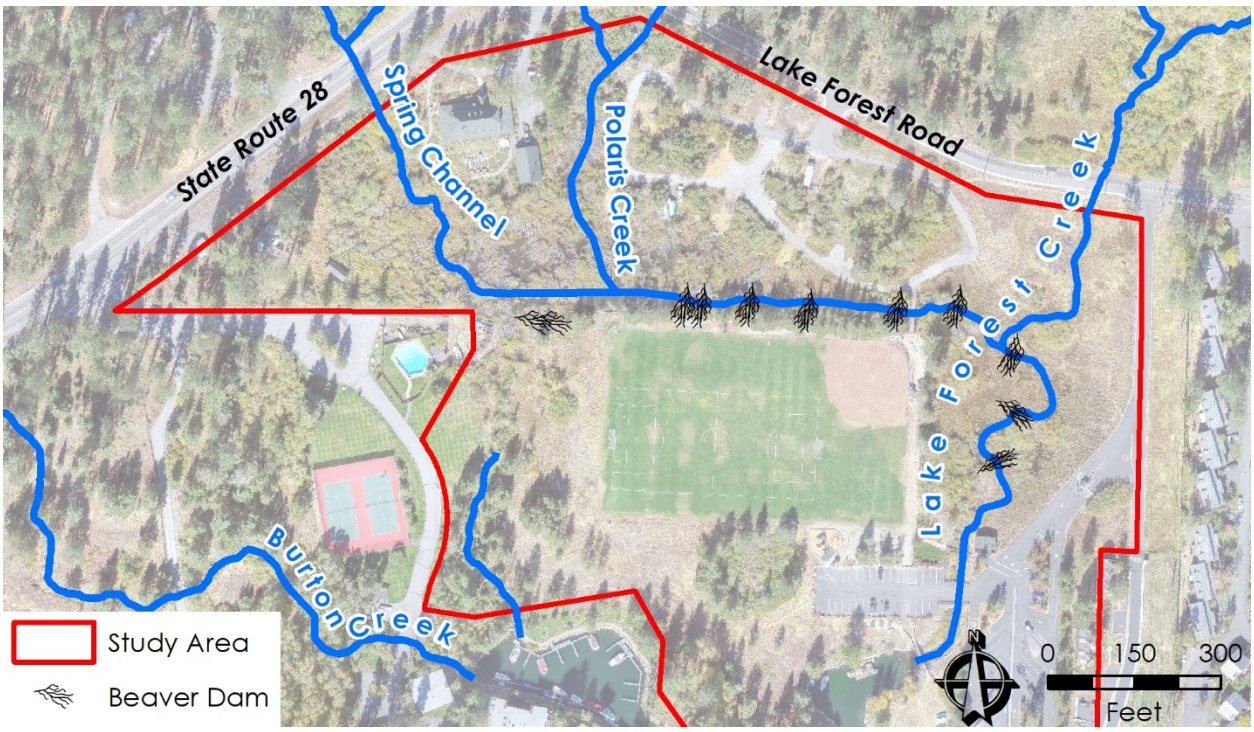

Figure 9. Beaver dams in the Study Area. Conditions as of summer 2018. Mapping is approximate and it is possible that more beaver dams were present.

3.7 Biological and Wetland Resources

A biological and wetland resources assessment was completed for the Study Area (Salix, 2019; see Appendix B) to characterize the plant, animal, and habitat types present on-site, and identify which are designated as special-status or sensitive. The information was used to identify constraints and opportunities for the restoration design, and to make recommendations regarding permitting and mitigation strategies for future phases of the project. Limited biological resource assessments were completed for the relocation sites, and the Regulatory Considerations section of the feasibility study was completed in consultation with the project biologists to identify the potential regulatory challenges at relocation sites.

Databases maintained by various resource management agencies (e.g. U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, California Native Plant Society) were queried for special-status species within a five-mile radius of the Study Area and

further refined based on field surveys and best professional judgement by the project biologists; a summary of special-status plants and animals determined to have some potential to occur within the Study Area is provided in Table 1. Anecdotally from the public outreach surveys, Pomin Park was noted to be among the best sites in the region for bird watching. Other flora and fauna were documented to be present on-site, however the special-status species are most pertinent to the restoration project because they will influence the permitting process and potential mitigation measures. Ultimately, the restoration of the Polaris wetland complex is anticipated to increase wildlife habitat acreage, but consideration of the short-term impacts associated with construction activities will be important to limit effects on populations of special status and other species.

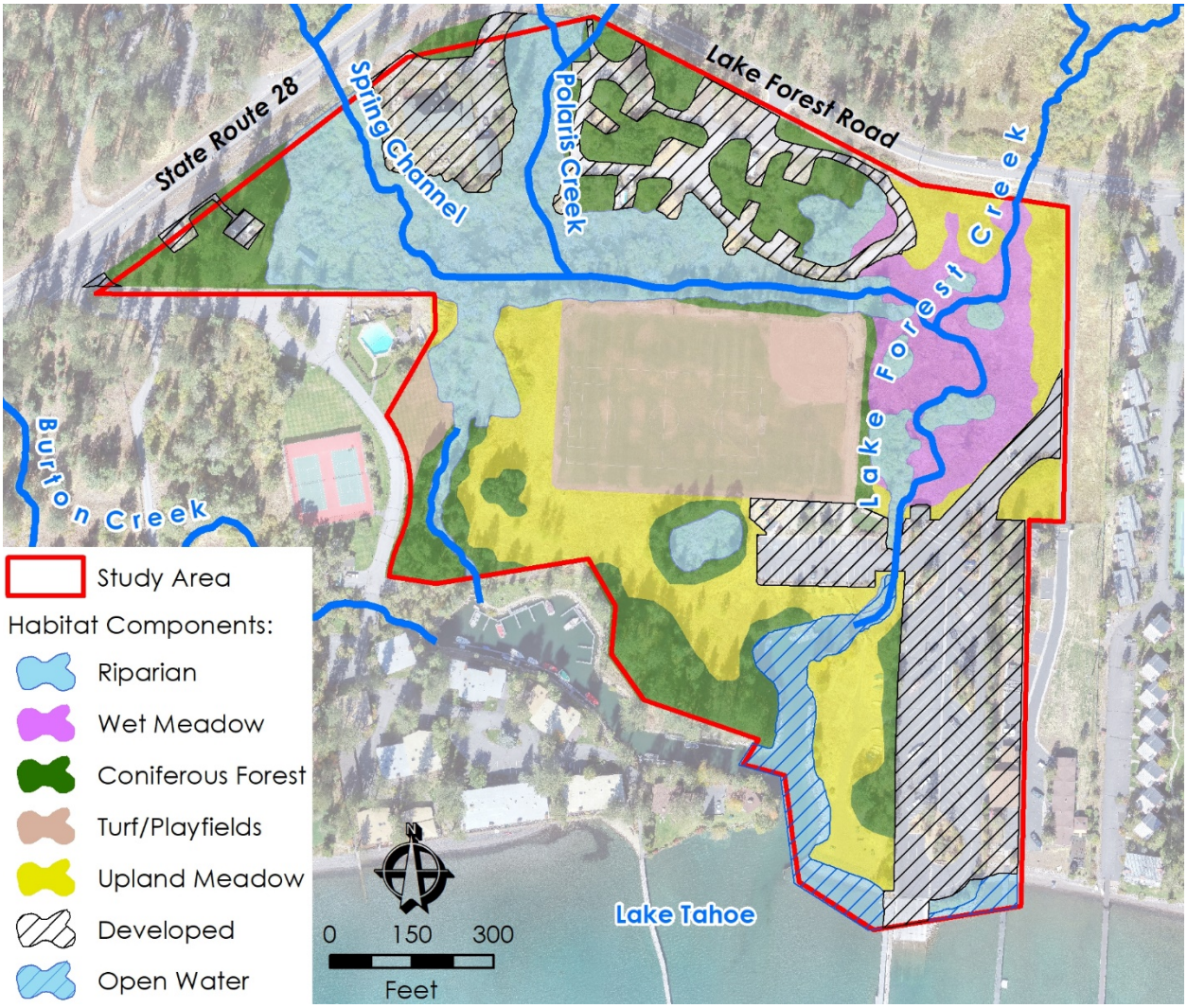

Figure 10. Habitat types within the Study Area. Adopted from Salix (2019). Wetland areas are subject to change over time and are influenced by beaver activity.

Table 1. Special-status plant and animal species determined to have some potential to occur within the Study Area. Adopted from Salix (2019)

Special-Status Plant Species		
Common Name	**Scientific Name**	**Potential for Occurrence within Study Area**
Davy's sedge	*Carex davyi*	Possible
Woolly-fruited sedge	*Carex lasiocarpa*	Possible
Mud sedge	*Carex limosa*	Possible
Santa Lucia dwarf rush	*Juncus luciensis*	Possible
Marsh skullcap	*Scutellaria galericulata*	Possible
Munroe's desert mallow	*Sphaeralcea munroana*	Unlikely
Oregon fireweed	*Epilobium oreganum*	Possible
Uspswept moonwort	*Botrychium ascendens*	Possible
Scalloped moonwort	*Botrychium crenulatum*	Possible
Mingan moonwort	*Botrychium minganense*	Possible
Western goblin	*Botrychium montanum*	Possible
American mannagrass	*Glyceria grandis*	Possible
Donner Pass buckwheat	*Eriogonum umbellatum torreyanum*	Unlikely
Alder buckthorn	*Rhamnus alnifolia*	Possible
Plumas ivesia	*Ivesia sericoleuca*	Possible
Special-Status Animal Species		
Lahontan cutthroat trout	*Oncorhynchus clarkia henshawi*	Unlikely
Sierra Nevada yellow-legged frog	*Rana sierrae*	Possible
Northern leopard frog	*Lithobates pipiens*	Unlikely
Southern long-toed salamander	*Ambystoma macrodactylum sigillatum*	Possible
Bald eagle	*Haliaeetus leucocephalus*	Unlikely
Northern goshawk	*Accipiter gentilis*	Possible
Yellow warbler	*Dendroica petechia brewsteri*	Likely
Willow flycatcher	*Empidonax traillii*	Possible
Sierra Nevada snowshoe hare	*Lepus americanus tahoensis*	Possible
Western white-tailed jackrabbit	*Lepus townsendii townsendii*	Unlikely
Sierra Nevada Mountain Beaver	*Aplodontia rufa californica*	Possible
California wolverine	*Gulo gulo*	Unlikely
Pacific fisher	*Martes pennanti (pacifica) DPS*	Unlikely

Possible: Suitable habitat occurs within the Study Area and Study Area is within the range of species.

Likely: Good habitat occurs, but the species was not observed during surveys

Unlikely: Minimal or marginal quality habitat with restrictions on the possibility of species occurring.

Habitat types within the Study Area were mapped by Salix (2019) and are shown in Figure 10. The limits of the wetland areas correspond with areas that have not been disturbed according to the historical aerial photographs (i.e. Figures 11 through 16) or where a restoration project has been implemented. Apart from the main (largest) wetland area that is centered on creeks through the Study Area, two other wetland areas appear to have not been disturbed by development: an area enclosed by the campground loop road and a cluster of woody vegetation just south of the athletic field. Other areas within the Study Area that have been disturbed by development have likely converted from wetland habitat to upland meadow or conifer forest. The notion of conifer encroachment is consistent with SEZ evaluations completed by TRPA (2019).

3.8 Historical Conditions

The Polaris-Pomin wetland complex has been affected by various historical land uses—mainly roadways, logging, and community development—the cumulative effects of which have led to the current impaired state of the wetland. The most pertinent historical land use activities are summarized herein, and a more comprehensive account of watershed history and disturbance is provided by Lindström (2019; see Appendix A).

3.8.1 Roadways

The first European settlers arrived in the Tahoe Basin by horseback or by foot in the early-19th century. Growth in the basin was accelerated with the entrance of automobiles around 1910 and by 1927 paved highways circled the lakeshore. The present-day alignment of State Route 28 and Lake Forest Road is shown on maps dating back to 1874, and can be seen in the earliest available aerial photograph from 1939. In the 1950s, State Route 28 was re-routed to bypass the Lake Forest Road loop, and it has remained in this alignment until present day. The establishment of State Route 28 as the main highway for access to the north shore quickly led to numerous minor collector streets to support residential and commercial development during the latter part of the 20th century. Roadways are significant to the degradation of wetland resources for two reasons. First, roadway development enabled the movement of people, goods, and services into and through the Tahoe Basin and marked the beginning of most other watershed disturbances. Second, traditional roadway engineering treated waterways as a nuisance to be managed, rather than an environmental amenity to be preserved. This approach often led to surface water being focused to relatively small culvert or bridge crossings and/or confined to a simplified ditch, which is often a trigger for geomorphic instability.

3.8.2 LOGGING

The history of logging in the Tahoe Basin is closely tied to the history of the Comstock Lode which created a large timber market to support railroads and mining operations. Logging occurred in several phases between the 1860s and 1970s. By the 1980s, land managers saw forests having more recreational value and large-scale logging operations slowed. A large wharf can be seen in the earliest aerial photos of the Study Area and is evidence of the logging history in the vicinity; the wharf was used to resupply steamers with cordwood which was skidded by teams of horses from nearby forests (Lindström, 2019). While commercial logging is no longer practiced in the Polaris Creek watershed, the legacy effects of logging can still be observed; primarily, as scars left on the landscape by former logging roads. Coe (2006) showed that sediment production from native surface roads in the Sierra Nevada region can be as much as 25 greater than rock surface roads. Roads that are poorly designed and maintained also have the potential to capture flow and alter drainage patterns. Topographic mapping reviewed for this study showed that a road on the southeast flank of Mount Watson may be redirecting a roughly 200-acre area away from Burton Creek and into the Polaris Creek watershed. Another line of evidence for drainage alteration can be found on the 1895 topographic map for Truckee which showed the headwaters of Burton Creek draining to Dollar Creek[4]. The net effects of road capture and drainage alternation is concentration of flow, which leads to erosion, which leads to sediment loads being delivered to downslope areas. Abandoned flumes that were once used to transport logs could be even more damaging; unlike roads which were haphazardly graded and only happen to redirect water, flumes were designed specifically to convey water.

Apart from logging roads, historical logging activity would have meant large portions of the watershed were once stripped of vegetation. Vegetation patterns influence how water and sediment moves through the watershed, and it is plausible that episodes of logging led to short-term destabilization of soil high in the watershed, which then worked its way through nearby creeks. This type of "sediment pulse" is capable of upsetting the natural balance of water versus sediment far downstream of the logging activity and can lead to yet more erosion. Lastly, since large woody debris helps to stabilize steep channels and modulate sediment transport in mountainous watersheds, removing the source of large woody debris by logging would provide a second mechanism to destabilize creeks. As a result, it is likely that the Polaris wetland complex experienced an

[4] The location of Burton Creek on the 1895 mapping may be an error, but this example emphasizes the disturbance history of the watershed, as well as subtleties of watershed divides, as discussed in the surface water section of this report.

episode or multiple pulses of sediment which caused portions of the Study Area to aggrade, leading to a wetland complex that is higher in elevation than pre-disturbance conditions, which may have contained more areas of open water associated with a lagoon or estuarine type of environment, though there is little evidence of a lagoon at this location.

3.8.3 Community Development

Tourism in the Tahoe Basin saw a steady increase during the first half of the 20th Century as road networks made the region more accessible. More resorts and hotels to accommodate visitors spurred the development of subdivisions and expansion infrastructure to meet the rising demand from tourist and full-time residents to operate and maintain the locally based services. Figures 11 through 16 are a series of historical aerial photographs of the Study Area from 1939 through present-day conditions. The photos show the onset of the most aggressive period of development in the 1960s; this timing is directly aligned with controversy over rapid growth throughout the Tahoe Basin which resulted in the eventual formation of the TRPA.

The historical aerial photos show that the Polaris wetland complex went largely undisturbed during the 1940s and early 1950s (Figures 11 and 12). The only visible development within the Study Area before the 1950s was the Tahoe Hatchery (first built in the 1890s and updated in 1920) and a northwest-southeast oriented feature that is presumed to be a road linking the wharf used to supply cordwood to steamers with the upland sources for the cordwood. A number of subdivisions began development during this period in the periphery of the Study Area (Lake Forest, Highlands, Dollar Hill). While impacts to the Polaris wetland complex from the subdivision projects cannot be discerned in the historical aerial photographs, this period likely marks the beginning of hydromodification impacts that were eventually addressed by erosion control projects in the 2000s (i.e. Wood Rodgers, 2007).

The most drastic impacts from community development to the Polaris wetland complex happened in the 1960s when the boat ramp, campground, and Star Harbor projects were implemented. The 1969 aerial photograph (Figure 13) shows that the central portion of the Study Area—the present-day location of the athletic fields—was impacted by fill placement during this period, likely from the creation of the artificial harbor and other earthwork activity from nearby projects. The east-west ditch was constructed to convey surface water around the north and east sides of the grading area. Lake Forest Creek

also appears to have been straightened to facilitate the roads connecting the campground to the boat ramp.

Comparison of the 1969 (Figure 13) and 1976 (Figure 14) photographs showed that the Lake Forest community was mostly built out by the mid-1970s, and in general, the pace of community development had slowed. The area disturbed by fill placement in the 1969 aerial photograph was redeveloped into the present-day configuration as an athletic field and Robert Pomin Park. The field was built in 1981 by local volunteers to address the growing need for recreational facilities in the community, and was later dedicated to Robert Pomin, a long-time Tahoe City resident, TCPUD board member, and proponent of youth sports. After Pomin Park was built, the only projects within the Study Area have been aimed at undoing impacts of previous generations. U.C. Davis implemented a project in 2010 to restore a pond that was part of the former hatchery operation into wetland habitat with interpretive trails. Placer County completed one component of the Lake Forest Erosion Control Project in 2010 that removed the roads linking the campground to the boat ramp and restored Lake Forest Creek and a portion of Polaris Creek into a more natural, sinuous planform with adjacent wetland areas.

Figure 11. Aerial photograph from 1939 (Study Area outlined in red). Earliest available photograph showing the Polaris wetland complex in its least disturbed state. Some disturbance had already occurred as of 1939 (hatchery building, major roadway, and residences).

Figure 12. Aerial photograph from 1953 (Study Area outlined in red). Polaris wetland complex is still relatively undisturbed. Bypass to Lake Forest Road (current alignment of State Route 28) was newly constructed.

Figure 13. Aerial photograph from 1969 (Study Area outlined in red). Most disturbance to the Polaris wetland complex occurred in the mid-1950s through 1960s. The campground, boat ramp, coast guard station, and Star Harbor development were built during this time. An artificial harbor was excavated and fill placed in the present-day athletic field area. The east-west ditch was constructed to route surface water around the fill.

Figure 14. Aerial photograph from 1976 (Study Area outlined in red). Athletic fields not yet constructed.

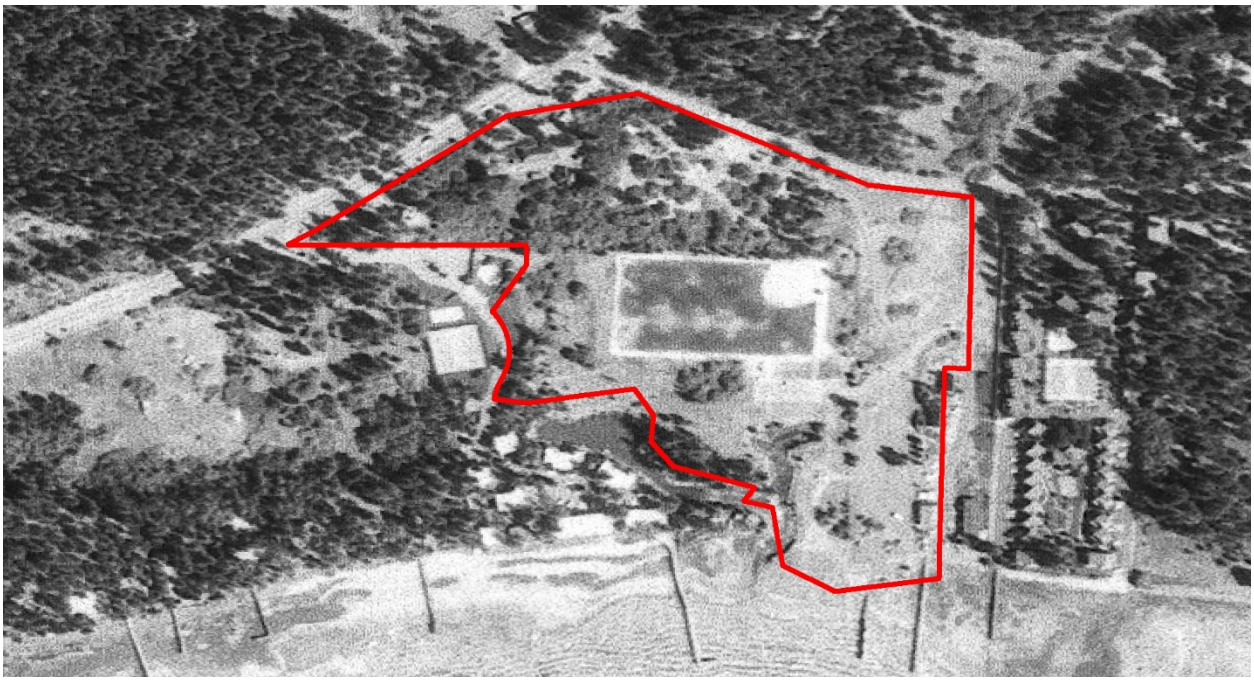

Figure 15. Aerial photograph from 1992 (Study Area outlined in red). The athletic field was constructed in the early 1980s. Lake Tahoe water level is very low (more than one foot below the natural rim) and the mouth of Star Harbor is barely open to the lake.

Figure 16. Aerial photograph from 2016 (Study Area outlined in red). The road connecting the campground to the boat ramp was removed and Lake Forest Creek realigned to a more natural planform. Improvements to the boat ramp and Pomin Park were also completed.

3.9 Cultural Resources

A cultural resources investigation was completed for the Study Area plus a 1/8-mile radius to provide preliminary screening of documented cultural resources. The information was used to evaluate whether the restoration design would potentially impact cultural resources, and whether an avoidance or mitigation strategy should be pursued. Screening was not completed for the relocation sites as part of this feasibility study, however, general background information on the regional history was compiled to provide insight on what might be encountered at the relocation sites. The cultural resources investigation was completed consistent with the guidelines established by TRPA (Code of Ordinances, Chapter 67) and State and County antiquities guidelines for CEQA such that this work may be built upon during future phases. The tasks of this effort included:

- Review historical and archaeological background research for the Study Area;
- Conduct records searches of the master archaeological inventory at the North Central Information Center (NCIC) at California State University, Sacramento;

- Request Sacred Land File searches with the Native American Heritage Commission (NAHC) and initiate follow-up contacts with local tribal organizations identified by the Commission; and
- Summarize the findings in a report, provided as Appendix A to this feasibility study.

Two cultural resources were identified within the Study Area that have been inventoried as part of previous studies. A prehistoric lithic scatter was identified in the southwest corner of the Study Area near the mouth of Burton Creek. Field surveys are needed to confirm the content and integrity of the remains if there is potential for the restoration project to disturb the area. The precise location of the prehistoric site is confidential and is not presented herein, however, its extents were used to inform later sections of this document. The second site is the historic (1963) Lake Forest Boat Ramp, the same location as the present-day boat ramp. The resource was inventoried and evaluated in 2009 and found ineligible for listing in the National Register of Historic Places and the California Register of Historic Places. Regardless, the boat ramp site was inconsequential for the restoration design since that area was considered not feasible for relocation.

3.10 Existing Utility Infrastructure

In addition to obvious surface infrastructure discussed in other sections (i.e. roads, parking lots, buildings, etc.), multiple types of underground infrastructure cross the Study Area to service developed areas. Figure 17 shows TCPUD mapping for wet utilities (i.e. sanitary sewer and domestic water) in the vicinity of the Study Area. The Lake Forest Boat Ramp has a small storm drain system, but it is not discussed since it does not affect the restoration design. Unlike dry utilities (i.e. electric, fiber optic, cable), wet utilities tend to be more expensive, disruptive, and logistically complex to relocate. As such, wet utilities are the primary focus of this section because they would pose the greatest constraints to proposed restoration activities in the Study Area.

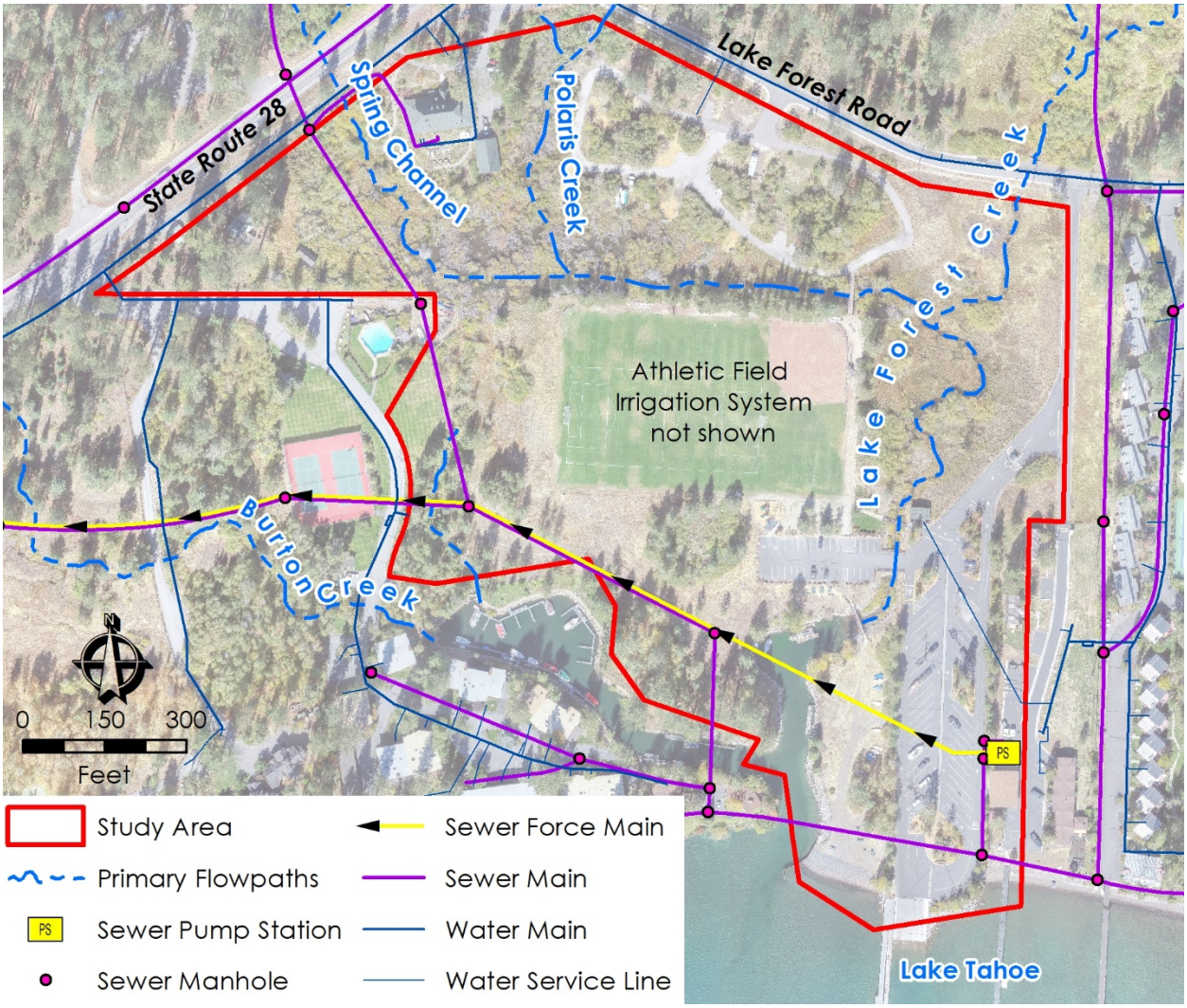

Figure 17. Existing wet utilities in the Study Area vicinity. Data source: TCPUD. Locations of utilities have not been confirmed and mapping may be incomplete. In particular, sewer laterals are not shown.

Water mains are present over a small portion of the Study Area and are generally located around the periphery. Sewer lines extend over a larger portion of the Study Area, primarily focused over the area to the south of the athletic field. As-built drawings for the sewer system obtained from TCPUD show that the gravity sewer lines are 5 to 10 feet deep, and the 10-inch diameter force main is roughly 6 feet deep. The force main services a significant portion of the Lake Forest area by pumping wastewater from a low point near the U.S. Coast Guard station to gravity mains leading to Tahoe City. A second, smaller pump station is located on the north side of the Study Area and is presumed to service the U.C. Davis Field Station building only to overcome low ground. From Tahoe City, the Truckee River Interceptor exports all wastewater from the northwest quadrant of the Lake Tahoe basin to the Tahoe-Truckee Sanitation Agency's Water Reclamation Plant

in Martis Valley, located east of Truckee. In addition to the sewer lines, several manholes are located within the Study Area and are accessed by TCPUD for bi-annual and emergency maintenance. Maintenance is done with 10-ton vacuum trucks which must be able to drive within 15 feet of manholes to perform service. For projects where earthwork is proposed over a water or sewer line, TCPUD requires a minimum of three feet of cover be maintained.

3.11 User Groups

This section provides an objective assessment of how various subsects of the Study Area are used by the public, and attempts to quantify the amount of use. The TCPUD Lake Forest Boat Ramp and the U.C. Davis Tahoe City Field Station are not discussed in detail herein because the feasibility study did not consider relocation of either facility given the extreme constraints associated with doing so. It is worth noting, however, that the boat ramp parking area frequently reaches maximum capacity in the summer months, which results in overflow trailers parking in unformalized areas throughout the Lake Forest neighborhood. This topic is addressed by some of the restoration design elements presented later in this report.

To gain an understanding how Pomin Park is used by the public under its current condition community members were queried as part of the outreach effort. Key results from the surveys are summarized as follows:

- The athletic fields are heavily used in the spring through fall for youth sporting events and practice (soccer, little league, and lacrosse). The fields are also used by all age groups for non-organized sporting activities.
- The park is valued for open space, beach access, walking, and dog play.
- The playground is used by community members and is an added amenity for families with small children during youth sporting events.
- The park is occasionally used for other events like laser races (small sailboats) which use the open space for staging and the harbor for access to Lake Tahoe.
- Bird watching is noted to be exceptionally good at and around the park.

Community members were also asked about how frequently they use Pomin Park for the above purposes. Thirty percent said they use the park more than 20 times per year, and more than 50 percent said they use the park at least 10 times per year. The majority of

survey respondents were local residents; as such, more input was gathered on Pomin Park compared to Lake Forest Campground which tends to be used mostly by out-of-town visitors.

Historical data for the Lake Forest Campground is summarized in Table 2 to quantity the level-of-use. The data show that when the campground is open, it is consistently underutilized. Several of the campground sites—in particular, the four to five sites on the south end of the campground that abut the wetland complex—are frequently closed due to flooding. A significant portion of the underutilization shown by the data is due to site closures. Regardless, if 5 of the 20 total sites are assumed to be consistently unusable due to flooding, the data would still show that the campground is not used to its maximum capacity.

Table 2. Historical use data for Lake Forest Campground. Data provided by TCPUD. There are 20 campsites total. Full utilization is 600 sites occupied in 30-day months and 620 sites in 31-day months.

Campground Sites Occupied by Month									
Month	**Year**								
	2011	2012	2013	2014	2015	2016	2017	2018	Monthly Total
May	0	30	17	54	10	31	23	50	215
June	63	132	176	155	187	261	238	263	1,475
July	298	431	330	374	337	412	305	433	2,920
August	216	264	295	298	343	316	350	372	2,454
September	80	191	136	63	160	195	229	199	1,253
October	5	3	2	11	35	14	29	14	113
Yearly Total	662	1,051	956	955	1,072	1,229	1,174	1,331	8,430

4 CONCEPTUAL RESTORATION DESIGN

This section describes the development of conceptual restoration designs to restore ecological and physical processes to the Polaris wetland complex. The section begins by describing the major findings from the existing conditions analysis and how they formed the general approach for restoration. Second, additional details from the existing conditions analysis are applied to identify constraints and opportunities that further shaped the general approach. The benchmark for full restoration of the Polaris wetland complex is the pre-disturbance condition of the mid-1800s, however, this is not a reasonable goal because that era pre-dates nearly all development in the Tahoe Basin. As such, the constraints and opportunities analysis is important for documenting how the feasibility study arrived at designs for "maximum potential restoration" within the context of the current landscape. Lastly, the various elements of the restoration design are presented.

4.1 General Approach to Restoration

In the very simplest terms, the general approach for restoration is to remove fill and promote the spreading of surface water. Some of the largest impacts to the Polaris wetland complex can be seen in the 1969 aerial photograph when construction of the artificial harbor was underway. The area to the north of the harbor appears to be recently disturbed, and is presumed to be where spoils from the harbor excavation were placed. At the same time, the east-west ditch was constructed to route surface water around the fill placement. Although the 1969 aerial photograph shows disturbance over a large part of the Study Area, certain areas appear to have been left alone. The areas outlined in Figure 18 are interpreted to be minimally disturbed over time and indicative of the historical wetland surface elevation. The grading for the conceptual restoration design is largely based on interpolating elevations between undisturbed areas to estimate how much material needs to be removed to restore the historical wetland surface. This simplified approach is suitable for the conceptual design level, however, future projects phases will require additional lines of evidence (in particular, exploratory subsurface investigations) to confirm the excavation depths to wetland soils. By targeting the historical wetland surface, there is an opportunity for the restoration design to leverage high-quality wetland soils and a seed bank that are already on-site, but have not been exposed for more than 50 years.

Figure 18. Comparison of 1969 (left) and 2018 (right) conditions. The yellow areas are interpreted to be minimally disturbed over time and representative of the historical Polaris wetland complex surface.

Once the historical wetland surface is uncovered, hydrologic support to sustain the wetland is anticipated to be provided by baseflow from springs at times when other nearby ephemeral channels go dry. These same springs were likely an important component to the historical water balance for the wetland complex, and since they have not been severely impacted by development, they are anticipated to be sufficient to support the restored wetland complex.

The presence of a water source alone is not enough for the historical wetlands to rebound; the complex, diffuse flow patterns to spread water over a large area must also be restored. The conceptual restoration grading plan maximizes the spreading of water through two methods. First, the proposed grading is made as flat as possible to avoid channelization and promote diffuse flow. Second, bio-engineered structures are proposed throughout the wetland to encourage flow in multiple directions. Bio-engineered structures would consist of live debris jams, arrangements of partially buried logs, or similar methods that utilize natural materials (see Figure 19 for examples).

Figure 19. Examples of bio-engineered log structure (top) and debris jam (bottom). Both photos are taken from restoration projects constructed in Martis Valley (about 8 miles north of the Project Site) less than two years after construction and vegetation has not fully reestablished.

4.2 Restoration Constraints and Opportunities

For the sake of this feasibility study, constraints are defined as factors that limit the Polaris wetland complex from being restored to the pre-disturbance condition. Opportunities are defined as characteristics of the Study Area that can be leveraged to promote wetland restoration success.

This section does not characterize the relocation of Pomin Park or the Lake Forest Campground as a constraint, even though relocation of either would present an added challenge and cost to restoration. Along similar lines, permitting considerations were not treated as constraints because they are something that can be overcome. Constraints and challenges related to relocation of existing facilities and permitting are discussed later in this report (see Section 5).

4.2.1 CONSTRAINTS

Existing Facilities

All of the existing facilities within the Study Area have impinged on the historical Polaris wetland complex to varying degrees, however, not all facilities were considered feasible to relocate. The U.C. Davis Tahoe City Field Station and Lake Forest Boat Ramp were considered infeasible for relocation due to their high level of service to the community and the extreme difficulties in identifying comparable sites for their relocation. For this reason, restoration activities that would impact these features are not proposed, even though they are within the historical wetland complex.

Study Area Limit

The analysis of historical conditions presented evidence showing that Burton Creek was once a tributary to the Polaris wetland complex, but was rerouted into an artificial harbor in the 1960s. Realigning Burton Creek through the wetland complex was not considered because it could not be accomplished within the limits of the Study Area. Restoring geomorphic function at the mouth of Burton Creek has high potential for reducing fine sediment delivery to Lake Tahoe. The watershed area for Burton Creek is estimated to account for 77 percent of the total historical contributing area to the Polaris wetland complex, and likely contributes at least a proportionate amount of the total sediment load. While further study is needed to understand sediment loads from the various historical tributaries to the Polaris wetland complex, it appears likely that the rerouting of Burton Creek would provide a large water quality benefit. Although this topic is beyond the scope of this feasibility study, the grading for restoration designs have attempted to account for conveyance of Burton Creek floodwaters in the event that it is realigned as part of a future restoration project.

Elevations

Elevations of the proposed grading plan in the vicinity of the current athletic field are on the order of 10 feet higher than maximum water level in Lake Tahoe. Flow through the

project area must reach the lake elevation over a short distance, which will require a steep channel. Historically, the mouth of the Polaris wetland complex was likely further to the east from its current location so there was more distance to reach the lake elevation, hence, the channel would have had a milder slope. The Lake Forest Boat Ramp and U.S. Coast Guard Station preclude the restoration project from exploring relocation of the mouth and thus require a steeper slope along the flow path.

Sanitary Sewer

Two TCPUD manholes, gravity sewer lines, and a sewer force main cross the southern half of the Study Area. These are backbone pieces of infrastructure that have helped alleviate nutrient loading to the lake and serve a large portion of the Lake Forest neighborhood. Gravity sewer lines within the Study Area would be extremely expensive and disruptive to relocate, possibly having a higher cost than the restoration project. Sewer force mains would also be expensive to relocate, but are logistically less complex to redesign since they do not rely on gravity flow. Either type of sanitary sewer line is required to maintain no less than three feet of cover. The restoration designs therefore avoid impacts to the manholes and attempt to maintain the required cover depth over pipelines (field verification of pipe depths will be needed at advanced design stages). The restoration designs also provide access to the two manholes for routine maintenance activities. Maintenance is done with a 10-ton vacuum truck so the restoration project also leaves high ground for access routes.

Hydrology

Certain aspects of the hydrologic setting pose construction constraints to the restoration project. Persistent surface water from springs in the watershed, along with seasonally high groundwater levels, will require careful planning of the temporary dewatering system. Construction access routes will also require protective measures to minimize compaction of wetland soils.

4.2.2 OPPORTUNITIES

Existing Functional Wetland Area

The Study Area contains areas of existing, functional wetlands with high value as wildlife habitat, as well as areas where previous restoration projects have been implemented. These areas are recognized as a restoration opportunity because they can be expanded upon and serve as analog sites for the restoration project. Reconnecting the various

pieces of wetland habitat within the Study Area is also pertinent to addressing habitat fragmentation noted in SEZ evaluations by TRPA (2019).

Historical Wetland Soils and Seed Bank

The existing conditions analysis showed that fill was likely placed on top of a wetland area, and the general approach for restoration discussion described how the grading plan aims to target these historical surfaces. Unless a large clearing and overexcavation operation was completed prior to fill being placed on the wetland, it is likely that the wetland soils and seed bank are still intact. Supplemental revegetation and soil amendments will likely be necessary, but the historical wetland soils will provide a nourishing growing medium which, along with the seed bank, is expected to accelerate vegetation recovery.

Hydrologic Support

The existing conditions analysis showed that the historical hydrologic support for the Polaris wetland complex has not been impaired to the point that it would be unable to support additional wetland areas. As such, the existing spring-fed channels and fine-grained hydric soils are anticipated to be sufficient to support the restoration project.

Existing Stabilized Channels

Two existing stabilized channels are present on site that could be used to convey flows from the restoration project to Lake Tahoe. This is significant because overcoming the steep elevation gradient was identified as a restoration constraint. The first channel is a steep, boulder channel that was implemented as part of the Lake Forest Erosion Control project. The second channel is the Star Harbor Channel, where several boulder steps have been constructed. More work is needed to assess the stability of existing stabilized channels in the context of the restoration project, in particular it is unknown if engineering calculations were completed to support the original design of the Star Harbor Channel.

Beaver

Beaver have colonized the existing wetland area north of the athletic fields, as well as Lake Forest Creek, where previous restoration work by Placer County was completed in 2010. Attitudes toward beaver colonization vary according to land management goals. Beaver in the Study Area have been both a nuisance for maintaining the Lake Forest Campground and a benefit to the environment where high surface and groundwater levels are prolonged leading to expanded wetland areas. Although beaver presence in

the Study Area presents a potential restoration opportunity, more work is needed during future phases of the project to plan for how impacts from beaver activity will be managed.

Conifers

The Study Area received low scores for conifer encroachment in evaluations by TRPA (2019). There is an opportunity to remove the conifers and reuse them in bio-engineered structures and recycle them as mulch and slash to support revegetation.

4.3 Restoration Design Elements

The restoration design is presented in terms of three zones within the Study Area: the campground, athletic field, and harbor. Within each zone, two "design elements" are presented: one design element to represent the maximum restoration potential within the constraints discussed above, and one design element to represent a scaled-back (yet, meaningful) amount of restoration that also addresses community-driven needs.

Each design element has been designed to be modular, meaning that single elements could be implemented on their own, and combinations of elements from each zone could be combined to form a project. The modular approach addresses the project goal of providing flexibility in planning and implementation by allowing the project to be phased. Phasing is valued because it acknowledges that some elements have more constraints and are more complex, therefore will take longer to plan and fund. Elements that are easier to execute can be implemented in the meantime, which allows project costs to be spread over a longer period.

Although only two elements are presented for each zone, there are a number of variations for how each element is ultimately designed and constructed. Where applicable, the following sections describe variations on elements that were considered during design development; however, the narratives are not meant to be an exhaustive discussion of the possible variations. The elements have been conceived with enough detail to provide a basis for future decision making and to guide the process for how elements will be combined to form a comprehensive plan for restoration over the entire Study Area. Once that is in place, the restoration design elements will face further review and refinement during a later phase of the project.

Lastly, this feasibility study does not elaborate on every possible combination of design elements. This was deliberate because the process of planning the future configuration

of the Study Area will be done collaboratively among the landowners, project stakeholders, and the public. The goal of this feasibility study is not to make recommendations on what should be done, rather, the goal is to provide the technical basis for what can be done. Regardless, a limited number of figures have been prepared to help readers visualize how design elements can be combined to form a cohesive project. Plate 1 shows the maximum potential restoration and Plate 2 shows partial restoration that addresses community needs.

4.3.1 Design Element 1A: Campground Area – Full Restoration

Element 1A (Figure 20) proposes to remove the entire Lake Forest Campground and restore wetlands. All campground infrastructure would be removed, and the existing access loop road surface (gravel and asphalt pavement) would be excavated and off-hauled. In cases where the access road is built on fill, the material would also be removed and the road grade leveled to match the surrounding elevations to minimize chances for flow capture. Decompaction of the campsites would likely be required to provide a suitable planting surface. Several bio-engineered structures would be installed to direct a portion of Polaris Creek water though the campground area to provide hydrologic support for the restored wetland area. Lastly, the pedestrian bridge would be removed, unless stakeholders wish to construct a new trail through the former campground.

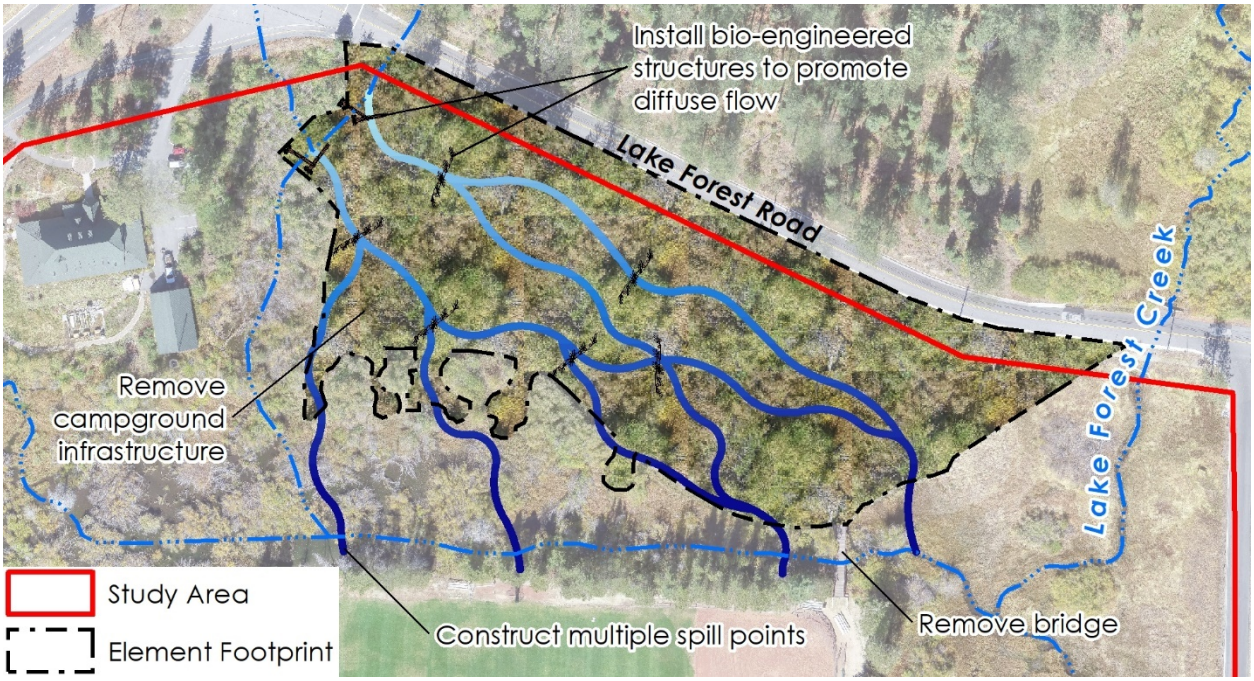

Figure 20. Design Element 1A: Campground area full restoration. The shaded blue areas are schematic to convey spreading of water and should not be interpreted as creating new channels.

4.3.2 Design Element 1B: Campground Area – Partial Restoration with Boat Trailer Parking

Element 1B (Figure 21) also proposes to remove the entire Lake Forest Campground, however, a portion of the campground area would be reserved for an overflow boat trailer parking area for the Lake Forest Boat Ramp. The parking area is obviously not a restoration feature, however, it serves a need of the Lake Forest community who is affected by boat trailer parking in informal spaces throughout the neighborhood. The parking area would also alleviate erosion caused by informal boat trailer parking thereby providing an indirect water quality benefit. The conceptual design for the parking lot attempts to avoid SEZs, however, additional analysis is needed to balance potential SEZ impacts with SEZ gains. As such, the parking configuration shown in Figure 21 represents the maximum possible size for the parking lot and the final design may be revised during future phases of the project. The southern half of the campground area would be restored in a similar manner as described for Element 1A, including infrastructure removal and road removal and leveling. Soils would be decompacted and bioengineered structures installed to spread a portion of Polaris Creek over the restored area.

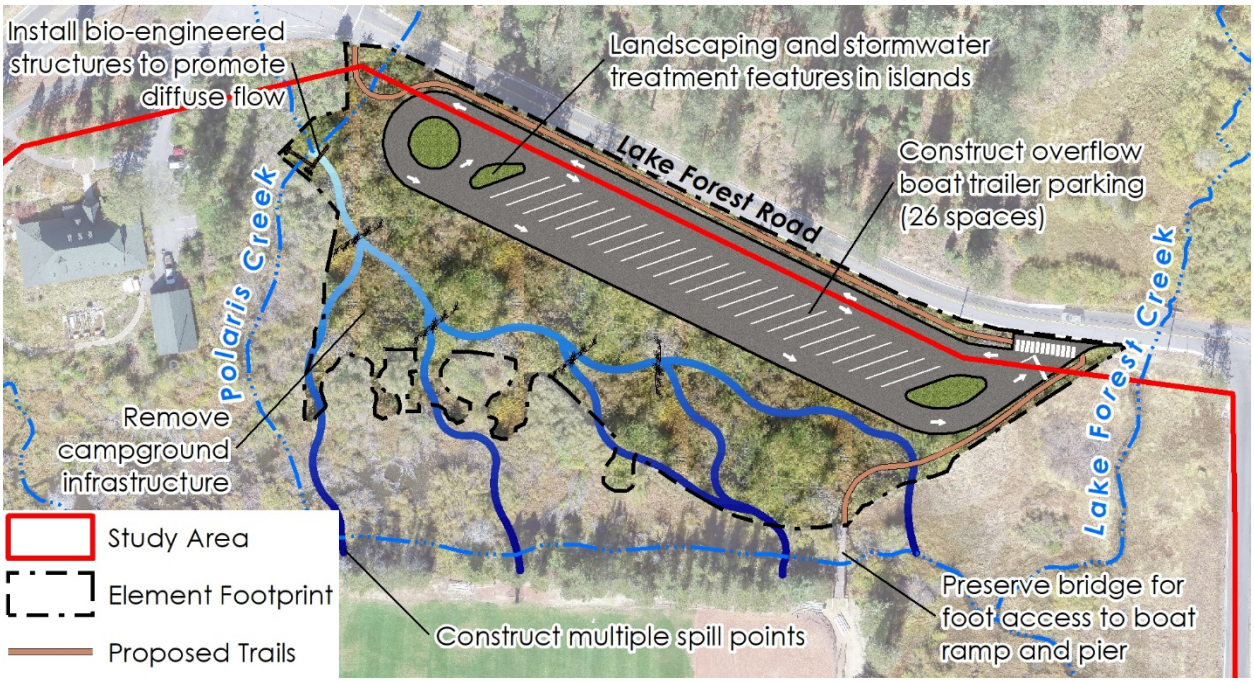

Figure 21. Design Element 1B: Campground area partial restoration with boat trailer parking. The shaded blue areas are schematic to convey spreading of water and should not be interpreted as creating new channels.

The parking area would be located on the north side of the site, where elevations are slightly higher and impacts to existing wetlands would be least. The parking area would

represent new impervious coverage, thus would need to provide stormwater treatment according to Lahontan Regional Water Quality Control Board standards. To this end, space is reserved in island areas to accommodate stormwater quality features. Signage will need to be installed to impose turning rules to and from the parking area due to the angle of the entrance driveway relative to Lake Forest Road. The existing bridge at the northeast end of the athletic field would be preserved and new trails constructed to provide access between the overflow parking and the boat ramp and pier.

Instead of constructing the boat trailer parking, a variation to Design Element 1B was considered wherein only a portion of the Lake Forest Campground is removed. The campsites located on the north side of the campground are not affected from flooding because they are situated higher above the wetland complex. Downsizing the campground use may only minimally affect use data shown in Table 2 since the current underutilization of the campground is due in large part to flooded campsites.

4.3.3 Design Element 2A: Athletic Field Area – Full Restoration

Design Element 2A (Figure 22) proposes to remove the entire athletic field, and restore wetlands affected by fill placement. Multiple spill points would be constructed along the north side of the athletic field to redirect water from the current ditch over the restored wetland area. The design would attempt to preserve flow directed toward Lake Forest Creek to maintain hydrologic support for the previously restored meadow in the east portion of the Study Area. Immediately downstream of the spill points, several log step structures would be constructed to provide a stable transition into the restored wetland area. The design proposes to concentrate most of the topographic relief within the athletic field area to the north side of the site to maximize the amount of low-slope area where wetlands could reestablish. A variation to the grading plan was considered to spread the topographic relief over the entire area to create more of a "tilted" surface; however, the risk of one or more low flow channels forming was thought to be greater, which lead to less water being distributed over the restored wetland area.

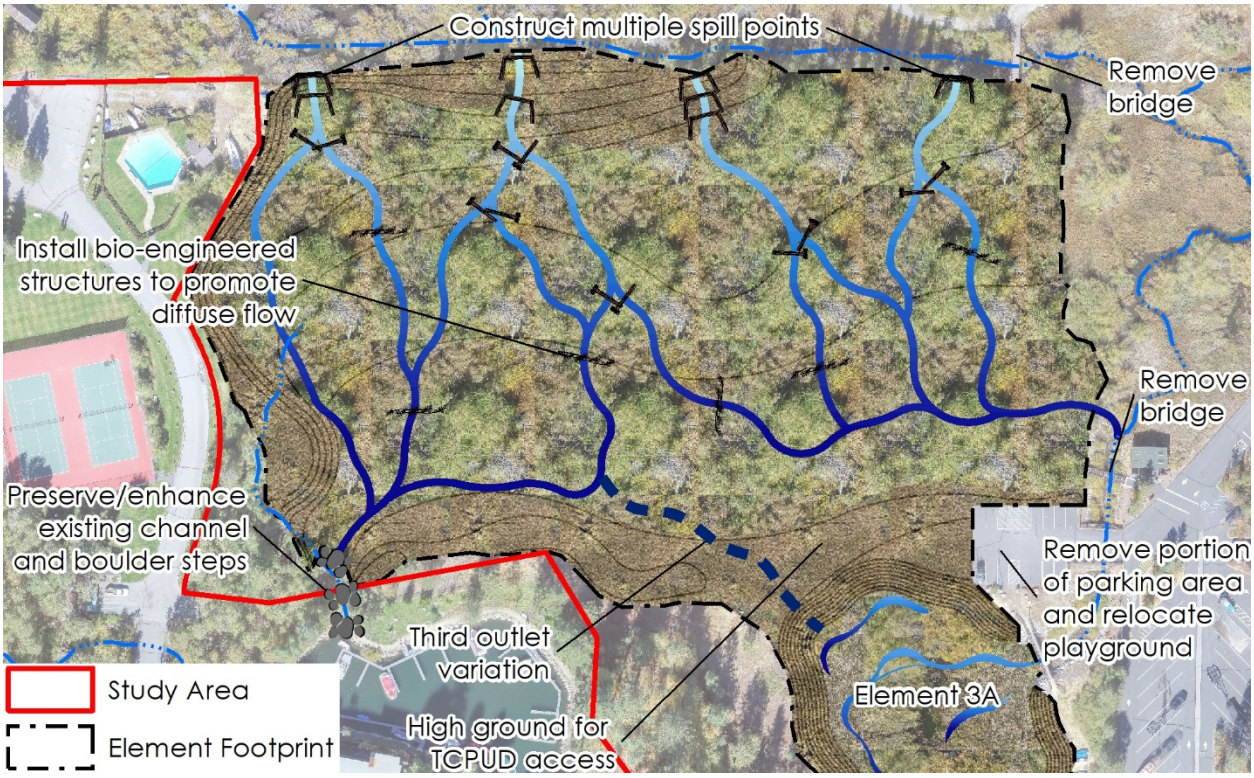

Figure 22. Design Element 2A: Athletic field area full restoration. The shaded blue areas are schematic in nature to illustrate spreading of water as a design intent. This should not be interpreted as design of new channels.

The central portion of Design Element 2A includes several bio-engineered structures to promote the slowing and spreading of water. As water approaches the south end of the site, a subtle strip of high ground will direct flow to the east or west. The high ground is also intended to preserve access to TCPUD manholes for maintenance activities and minimize grading disturbance over existing sanitary sewer lines, although more detailed analysis is needed to confirm that the required cover depths for sewer lines is provided. Surface water that is deflected to the west will be stepped down to the level of Lake Tahoe by existing boulder structures in the Star Harbor Channel. The boulder structures will need to be evaluated for stability under the new flow regime, and possibly enhanced to improve stability. Surface water that is deflected to the east will be stepped down to the level of Lake Tahoe by the existing steep, boulder-lined portion of Lake Forest Creek that was implemented as part of the Lake Forest Erosion Control Project. Under existing conditions, the channel conveys nearly all outflow from the Polaris wetland complex, and splitting the total flow between the channel and the Star Harbor Channel to the west would not compromise its stability.

A third outlet from the restored wetland area was considered as a variation to Design Element 2A (see dashed line in Figure 22). The third outlet would be located between

the Star Harbor Channel and Lake Forest Creek outlets described above, and would provide a direct connection to the harbor area. The third outlet would need to provide a stable transition to overcome the roughly 10-foot elevation difference between the restored wetland area and Lake Tahoe. The existing sewer lines complicate identifying a suitable alignment for a third outlet; the alignment would need to preserve maintenance access routes to TCPUD manholes and would need to provide appropriate vertical clearance over the sewer lines. The third outlet is not critical to providing enough conveyance for the anticipated flow rates and will require further consideration during future project phases. The main advantage is that it would further the project objective of restoring historical flow paths, albeit in an engineered channel.

4.3.4 Design Element 2B: Athletic Field Area – Partial Restoration with Field Modification

Element 2B (Figure 23) proposes to remove roughly one third of the existing athletic field area and remove fill to restore a portion of the historical wetland complex. The remainder of the athletic field area will be reconfigured by consolidating the soccer field to overlap with the outfield for the baseball diamond. The rotated soccer field would impinge on one of the undisturbed portions of the historical wetland complex (Figure 18), however, there would still be a positive net gain in wetland area. Although Design Element 2B would result in a smaller total area for the athletic field, it would offer a similar level-of-service to the community since the soccer and little league seasons minimally overlap.

The west portion of Design Element 2B would be restored in a similar manner as described for Element 2A, including multiple spill points at the north end leading to a flat, restored wetland area with bio-engineered structures to promote diffuse flow. Some flow toward Lake Forest Creek would be maintained to support the previously restored meadow. Unlike Design Element 2A, there is only one surface water outlet in Design Element 2B at the Star Harbor Channel. The grading plan for Design Element 2B allows Design Element 2A to be implemented at a later date with minimal disturbance to the restored wetland area. As such, Design Element 2B could be implemented as an early project phase and once a suitable relocation site for the athletic field is identified, full restoration (i.e. Design Element 2A) could be completed at a later date.

Similar to Design Element 2A, a third outlet to connect the restored wetland area with the harbor area could be included as a variation to Design Element 2B. The same advantages and disadvantages described for Design Element 2A apply for Design Element 2B, particularly the need to evaluate stability of the Star Harbor Channel with increased flows.

Figure 23. Design Element 2B: Athletic field area partial restoration with athletic field reconfiguration. The shaded blue areas are schematic in nature to illustrate spreading of water as a design intent. This should not be interpreted as design of new channels.

4.3.5 Design Element 3A: Harbor Area – Full Restoration

Design Element 3A (Figure 24) proposes to fill the entire east arm of the artificial harbor and re-establish lake fringe and meadow habitat. The west arm of the harbor cannot be filled as part of this project because it is outside of the Study Area and located on private property. The harbor would not be filled to the inferred elevation of the historical wetland complex (approximately the level of the boat parking area) because it would require filling Lake Forest Creek upstream of the harbor and relocating the steep transition to lake level within the Design Element 3A footprint. Instead, the existing steep channel is leveraged so restored habitat within the harbor area can be maximized.

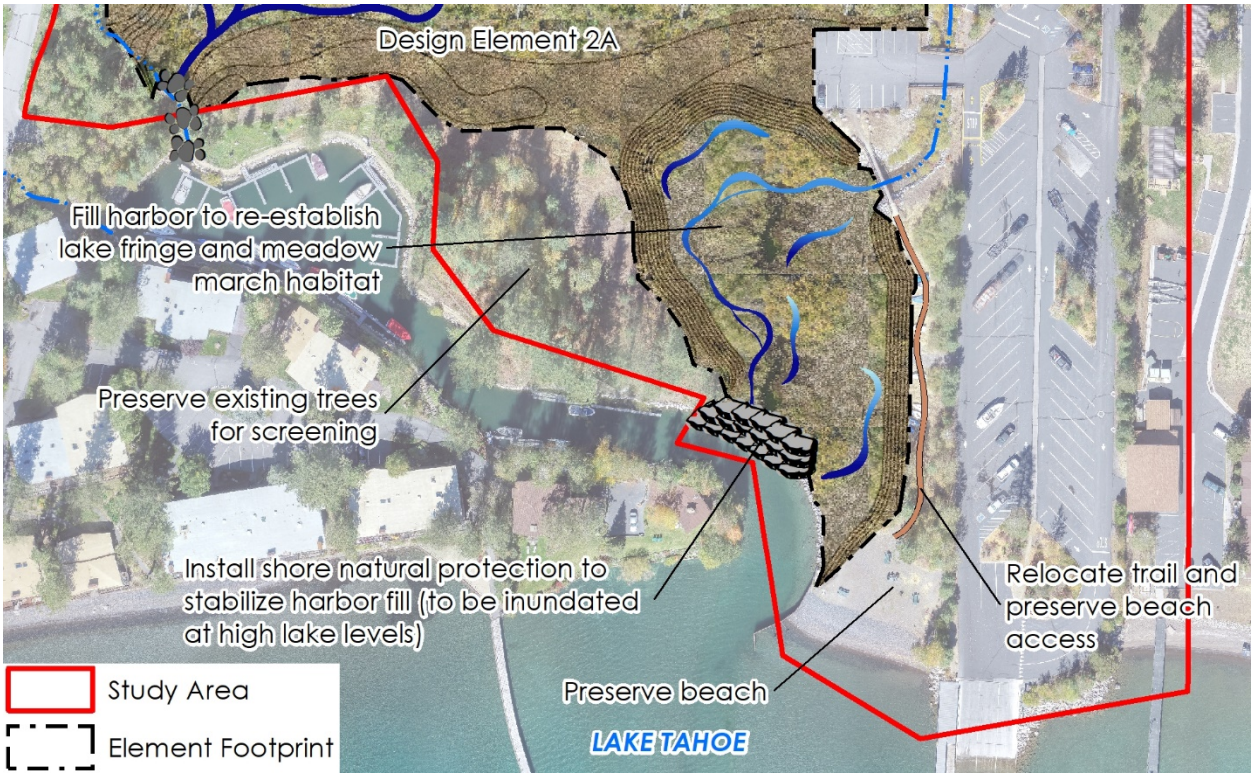

Figure 24. Design Element 3A: Harbor area full restoration.

The harbor will be filled to create a mostly flat surface at elevation 6,231 feet. The maximum legal limit for the water level in Lake Tahoe is 6,231.9 feet (NAVD88), so the surface would experience shallow inundation during high lake stands. During low lake level stands Lake Forest Creek and flows from the restored wetland would provide hydrologic support to this area. Grading to elevation 6,231 feet is based on the morphology of the Upper Truckee Marsh, a large marsh complex at the mouth of the Upper Truckee River located on the south shore of Lake Tahoe. Design Element 3A attempts to create a similar marsh environment by using Upper Truckee Marsh elevations as an analog. Within the harbor fill area, a small low flow channel will be graded (similar in size to Lake Forest Creek upstream of the restrooms), as well as several off-channel depressions that are anticipated to create additional open water habitat.

Since the entire harbor cannot be filled as part of this project, a shore protection feature must be installed to contain the fill and minimize the potential for the fill material gradually washing into Lake Tahoe. The shore protection feature would be designed to blend with the natural environment; the preliminary concept is stacked rounded boulders that would mimic natural, boulder-lined lake shoreline.

A variation to Design Element 3A was considered that expanded the grading footprint to the west, but two primary constraints led to the design in its current form. First, expanding the excavation to the west would conflict with TCPUD sewer infrastructure. Second, there is a grove of mixed poplar and conifers that may have been part of the historical wetland complex; the trees provide screening between the Star Harbor development and Pomin Park. The benefit of additional wetland area may not outweigh the value of the existing trees. Moreover, the grading would be contrived since a narrow strip of high ground would need to remain along the Study Area boundary.

4.3.6 Design Element 3B: Harbor Area – Partial Restoration with Boat-In Campsites

Design Element 3B (Figure 25) also proposes to fill the entire east arm of the harbor, however, a portion of the harbor area would be graded a few feet higher to create boat-in campsites.

The Lake Forest Boat Ramp is already a designated trailhead for the Lake Tahoe Water Trail, a network of public launch sites, landing sites, campgrounds, and restrooms that allow non-motorized boaters to circumnavigate the entire 72-mile shoreline of Lake Tahoe. The Lake Forest Campground is one of two north shore campgrounds on the Lake Tahoe Water Trail (the other is Tahoe State Recreation Area Campground, located one mile to the west of the Study Area). If the Lake Forest Campground is relocated, providing continued opportunities for boat-in camping on the north shore would be significant to maintaining facilities on the Lake Tahoe Water Trail.

Outside of the boat-in campsites, Design Element 3B would be restored in a similar manner as Design Element 3A. The harbor would be filled to an elevation of 6,231 feet to create marsh and meadow habitat. The shore protection feature would still be needed to contain the fill.

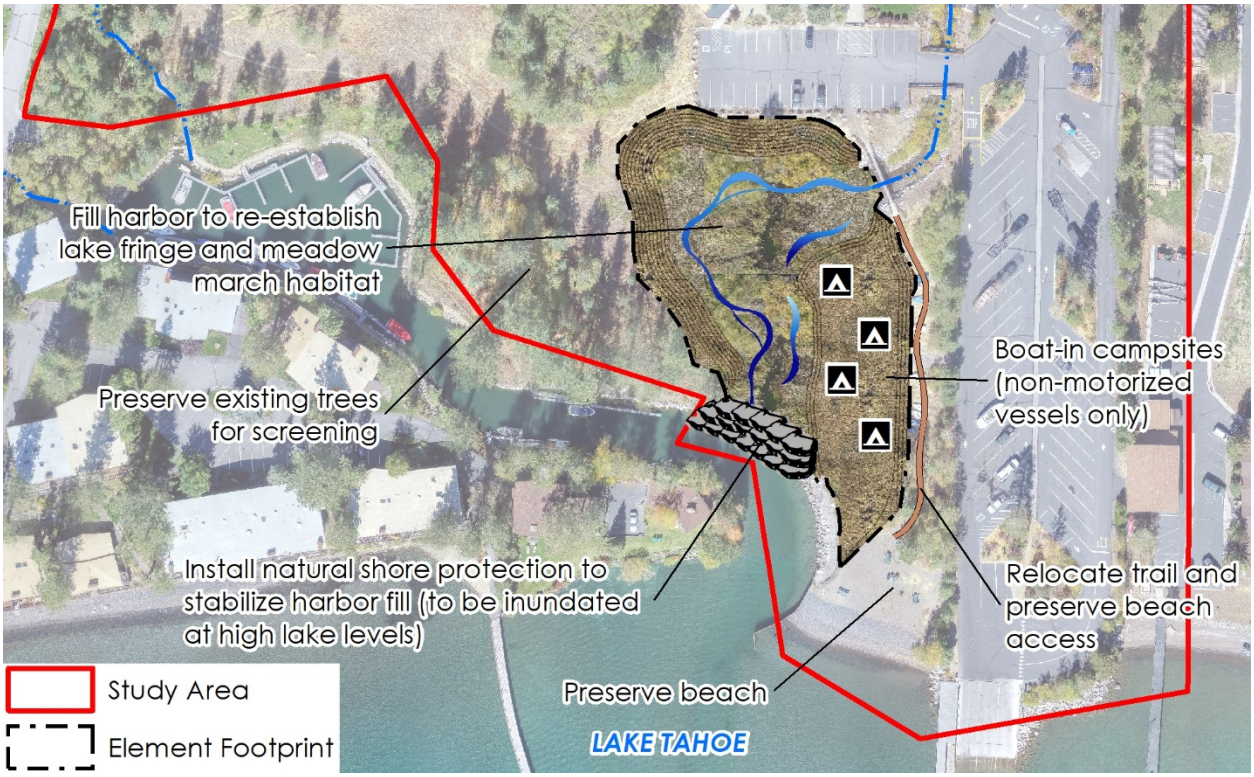

Figure 25. Design Element 3B: Harbor area partial restoration with boat-in campsites.

Multiple variations on how the boat-in campsites are incorporated into Design Element 3B are possible. The boat-in camping area could be made larger or smaller to achieve the desired balance of restoration versus recreation features, and additional areas of open (deeper) water could be incorporated.

5 RELOCATION OF POMIN PARK FACILITIES

5.1 General Approach to Relocation

The Relocation Study was organized to initially identify and vet a large number of potential sites, to arrive at those which could reasonably be assumed to be available for the proposed use. Once that group of sites was identified, Auerbach Engineering Corporation (AEC) further vetted the sites to determine the extent to which they met certain feasibility criteria related to access, infrastructure, and site area. The relocation sites were also reviewed for general habitat types and SEZ features (Salix, 2019; see Appendix B). The criteria were developed with the assumption that any potential relocation sites would provide amenities that are, at a minimum, equal to those at the existing Pomin Park and Lake Forest Campground. Sites that did not meet any of the feasibility requirements were eliminated from further evaluation. Finally, the public was engaged to gather community input on the remaining sites. Few of the relocation sites were large enough to accommodate both the athletic field and campground, however, there is no reason for the two to stay together, so each site was evaluated for either an athletic field or a campground, depending on the site characteristics.

5.2 Public Outreach

Outreach to engage community members regarding the Pomin Park and Polaris Creek Project occurred in September and November 2019. Approximately 90 community members provided input through interviews, online surveys, and a community workshop.

Most participants supported relocation of the athletic fields and recognized this as an opportunity to improve habitat, water quality, and the current recreation amenities. Many expressed the desire for additional field space to accommodate more programs and activities. It was noted that the soccer and baseball fields are used at the same time in spring, so the new location should be able to accommodate simultaneous use. Some participants suggested relocating the soccer and baseball fields to two different sites; this approach was not adopted for the relocation study because it will present an added challenge in leveraging restoration funds to relocate the fields. It was suggested that the new site provide enough fields to support population growth and additional field space for teams to warm-up.

Participants suggested that the fields be at a similar elevation with good sun exposure and drainage to allow for longer seasonal use. It was suggested that the fields be made

of natural grass that require low watering and maintenance and be orientated north to south to avoid sun in player's eyes.

Regarding location, the community asked that the fields be located centrally for all North Tahoe communities, especially Tahoe City. Participants requested that the fields be easily accessible from the main road and close to other amenities. There should be adequate parking with planned flow of traffic and drop-off areas, with no added traffic safety or congestion concerns.

Additional suggestions for the athletic field relocation included the following:

- Noise to nearby residences should be controlled or minimized
- A modern, safe playground close to the ballfields
- Indoor pool and recreation facilities for extended youth sports programs
- A skate park or other recreation opportunities for older youth and teens
- Lights for extended play, with concern for neighbors and light pollution
- Bathrooms that are accessible
- Seating for fans and families
- Natural trees for shade and reduced environmental impact
- Dog friendly
- Dedicated to Robert Pomin in the same way as the existing park

The public supported the relocation of the campground as long as the total number of campsites is preserved. Many of those familiar with the Lake Forest Campground noted that the campsites are often soggy and waterlogged, with some sites unusable for most of the season due to creek flooding. Participants were concerned with preserving the net total of campsites in the area, while supportive of moving them nearby to a more suitable location. It was suggested that campsites be moved to a well-designed, well-maintained campground close to the lake and that a kayak camping area be added.

More information regarding public outreach results can be found in the Summary of Public Input (Appendix C).

5.3 Relocation Site Identification and Selection Methods

AEC initially identified 16 potential sites for the Pomin Park and Lake Forest Campground relocation (Table 3). These sites were identified based largely on local knowledge, the fact that they are all publicly owned land with sufficient area to accommodate a development of some kind, they all have reasonable vehicular access currently, and all are within reasonable proximity to the current Pomin Park. Figure 26 shows the location of each of the potential sites. Note that the sizes of the sites do not reflect the actual parcel area, only the portion of that parcel that might be available for development.

Table 3. List of all public properties considered as relocation sites.

Preliminary Site Identification					
ID	**Property Name**	**Owner**	**Developable Area (acres)**	**Opportunities**	
				Athletic Field	**Campground**
1	64-Acres South	USFS	10.99	x	x
2	64-Acres North	USFS	4.70	x	
3	64-Acres East	USFS	7.24		x
4	Tahoe City Golf Course	TCPUD	27.1	x	x
5	Tahoe SRA	State Parks	4.98		x
6	Burton Creek	State Parks	6.99	x	x
7	Lake Forest North	CTC	5.44		x
8	Lake Forest South	State Parks	2.41		x
9	Lake Forest Glen	CTC	7.94		x
10	Highlands West	TCPUD/CTC	32.94	x	
11	Highlands East	TCPUD	12.78	x	
12	Skylandia Park	State Parks	23.33		x
13	Nahas Property	Placer County	10.77	x	x
14	Firestone Property	Placer County	73.98	x	x
15	North Field High School	TTUSD	2.21	x	
16	Rideout School	TTUSD	11.60	x	

Abbreviations:

CTC	California Tahoe Conservancy	TTUSD	Truckee Tahoe Unified School District
SRA	State Recreation Area	USFS	US Forest Service
TCPUD	Tahoe City Public Utility District		

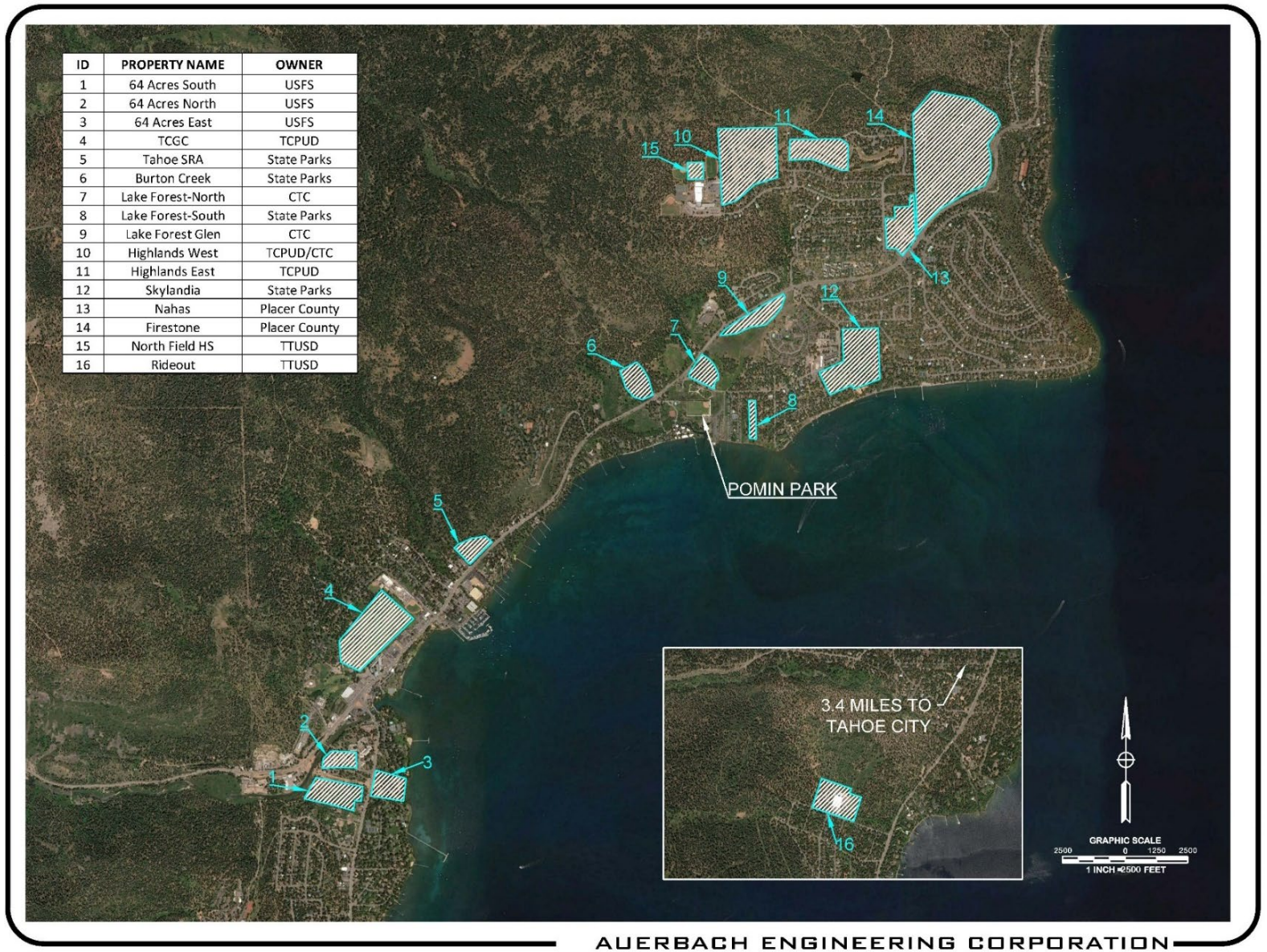

Figure 26. Map of all potential relocation sites.

5.4 Preliminary Screening Results

Two layers of analysis were undertaken to screen the initial list of sites. First, utilizing open source LiDAR, a slope analysis was conducted on these sites to confirm that the sites were within a range of natural ground slopes that could accommodate a large, nearly-level athletic field. While most of the properties were already well-known to the Consultant Team, it was useful to use that tool to depict the general site characteristics to others.

Next, a discussion with the Advisory Group and Consultant Team was held to identify obvious issues or concerns about how proposed uses might conflict with existing uses, zoning, or future plans. This resulted in a group of sites being removed from initial consideration. Table 4 summarizes the five sites that were eliminated and the reasons for elimination.

Table 4. List of relocation sites eliminated from further consideration.

Incompatible Sites		
ID	**Property Name**	**Reasons for Elimination**
1	64-Acres South	· Adjacent site is being considered for an athletic field and is a better option
4	TCGC	· Not compatible with current uses and planning
6	Burton Creek	· Not compatible with Burton Creek State Park General Plan
10	Highlands West	· Not compatible with existing and proposed uses · Higher elevation would affect seasonal use
11	Highlands East	· Not compatible with existing uses · Higher elevation would affect seasonal use
13	Nahas Property	· Not compatible with proposed uses · Limited dimensionally · Slopes no conducive to field development

64-Acres South

The site is known to be wet and whether mapped or otherwise, appears to be sensitive land. Furthermore, the 64-Acres North site is adjacent to 64-Acres South and offers more advantages for relocation. Any site owned by the USFS would require federal approval in addition to other local and state agency approvals.

Tahoe City Golf Course

Although there is physically enough area at TCGC, athletic fields would not be physically compatible with the current and planned future use as a golf course.

Burton Creek

California State Parks has adopted the General Plan for Burton Creek State Park (CSP, 2005). The General Plan outlines proposed uses and development of the park, including a trailhead and park offices at the Burton Creek site. The General Plan also proposes a campground for another location within Burton Creek State Park. The planned uses of this site would preclude it from being developed as an athletic field.

Highlands West

This site is at a higher elevation, which could limit seasonal use. Athletic fields would not be compatible with its existing and proposed use as a cross country ski area.

Highlands East

Similar to the Highlands West site, this site is at a higher elevation, which could limit seasonal use. Additionally, it is currently used as a cross country ski area, which would not be compatible with the athletic fields.

Nahas Property

This site is limited dimensionally, and portions of the site have steep grades. Workforce housing is proposed for this site, which would not be compatible with the athletic fields.

5.5 Planning/Design Criteria

AEC developed a list of additional criteria to vet the remaining potential relocation sites for Pomin Park and the Lake Forest Campground.

Criteria were based on providing equal amenities to those available at the existing sites, at a minimum. For instance, a playground should be provided similar in size to that existing at Pomin Park. The new athletic field location needs to accommodate a Under 12 (U12) soccer field, a little league field, and restrooms. Per AYSO guidelines, a U12 soccer field is 55 by 80 yards with an additional buffer around the field. The little league field must accommodate 200-foot outfield fences, dugouts, bleachers, and a scoring booth. Minimum size requirements considered the condition of overlapping little league

and soccer fields. While concurrent uses may be desirable from a future planning standpoint, it was beyond the scope of this study to plan for something more intensive than the current configuration.

The new campground needs to accommodate 20 campsites of a similar size to the existing campsites and would have access to the same amenities, including water and restrooms. Connection to the Lake Tahoe Water Trail is preferred, though not required for the new campground location.

Both athletic field and campground relocation sites were also analyzed for the following desired characteristics and criteria:

- Proximity to parking, infrastructure, existing location, and town center
- Compatibility with existing and surrounding uses
- Lower elevation, allowing for longer seasonal use of the facilities

5.6 Athletic Field Options

The athletic field relocation was narrowed down to four potential sites:

- Site 2 - 64-Acres North
- Site 14 - Firestone Property
- Site 15 - North Field High School
- Site 16 - Rideout School

The opportunities and constraints associated with each of these sites is discussed further in the sections below and are summarized in Table 5.

Table 5. Summary of constraints and opportunities for athletic field relocation sites.

Athletic Field Relocation Options				
Site	**Firestone Property**	**64-Acres North**	**North Field HS**	**Rideout School**
Opportunities				
Existing parking	x	x	x	x
Space for separate soccer and baseball fields	x			
Space for extended facilities	x			
Easy access by public transportation	x	x		
Low elevation		x		x
Good sun exposure	x			
Existing restrooms			x	x
Existing playground			x	x
Constraints				
Nearby residences	x		x	x
New disturbance	x	x		
Federal involvement/approval		x		
Driving distance from existing Pomin Park (miles)	1.5	2.8	1.8	5.5

5.6.1 64-Acres North

Figure 27 shows potential placement of the athletic fields and facilities at 64-Acres North.

Figure 27. Athletic field relocation concept for 64-Acres North.

Opportunities

64-Acres North is easily accessible on existing roads and bike trails, located adjacent to the Tahoe City Transit Center and located within walking distance of downtown Tahoe City. There is existing parking at this location. Lights or noise would not disturb neighbors at this location, as this site is not adjacent to residences. This site is at a low elevation and has good sun exposure, making it favorable for use in the spring when other areas are still under snow. There are no apparent wetlands or waterways and no mapped SEZ.

Constraints

64-Acres North is limited in size. The little league and soccer fields would overlap, limiting use to one sport at a time. There may be parking conflicts in the summer when rafters

and other recreational users occupy much of the existing parking. Additional parking may be required to address this. There is no additional room to expand the fields at this location. Lastly, the site is owned by the USFS, so federal approval would be required to develop this land.

5.6.2 FIRESTONE PROPERTY

Figure 28 shows potential placement of the athletic fields and facilities at Firestone. The Firestone Property is within the jurisdiction of North Tahoe Public Utility District (and not TCPUD) which would need to be addressed if this site were selected to relocate facilities that were originally operated by TCPUD.

Opportunities

Firestone is a large site that could accommodate additional recreational facilities beyond those existing at Pomin Park. The property is a designated receiving site for relocated recreational facilities in the Placer County Tahoe Basin Area Plan. There is already an existing highway encroachment and parking lot at this site for the paved and off-road bike trails, as well as nearby utilities.

Constraints

While portions of the Firestone property are defined by steep slopes, there are ample opportunities within areas that are less than 5 percent slope. The location of the athletic fields would be ideal near the existing parking lot and immediately to the east. There is sufficient area within this portion of the Firestone site to separate the uses into two separate fields. There is one mapped SEZ feature located along the eastern boundary of the site (a 0.1-acre area of Riverine/Channel), but no other apparent wetlands or waterways.

This property is largely undeveloped, and significant tree removal would be needed. Parking would need to be expanded to accommodate athletic field users. The public has expressed concern that turning in and out of this property from Highway 89 could be difficult and potentially dangerous during peak periods. Lastly, Firestone is adjacent to residences, and noise/lights could impact adjacent homeowners.

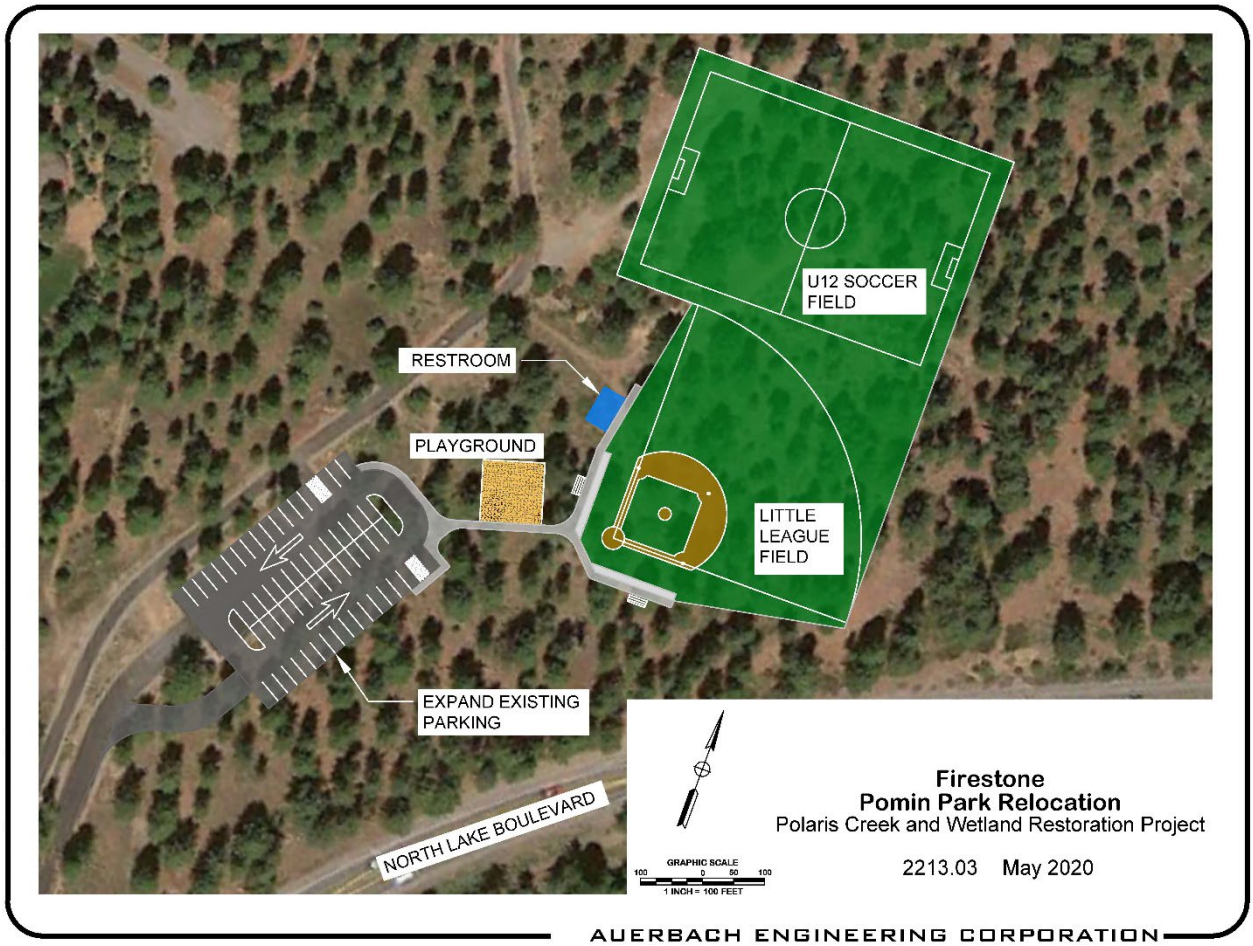

Figure 28. Athletic field relocation concept for Firestone Property. The concept shows separate soccer and little league field facilities, however, consolidating the fields with overlap would afford additional space for other recreational amenities.

5.6.3 North Field High School

Figure 29 shows potential placement of the athletic fields and facilities on the north field of North Tahoe High School.

Opportunities

North Tahoe High School has existing parking and other infrastructure in place that would reduce construction costs considerably. The land at this site has already been disturbed and would only need renovation, not new clearing. The site has good sun exposure. There is no mapped SEZ or other apparent wetlands or waterways.

Constraints

This location is difficult to access by bike and public transit. This site is at a higher elevation which could affect seasonal use of the fields. There is no additional room to expand the fields at this location, though adjacent athletic fields may provide space for teams to warm up. The baseball and soccer fields would overlap, limiting use to one sport at a time. Use of the fields would need to be coordinated with the high school to avoid conflicts with school team uses (soccer, football, track). As noted by residents at the public workshop, there would be a potential increase in traffic in the adjacent neighborhood, which already sees traffic from the high school.

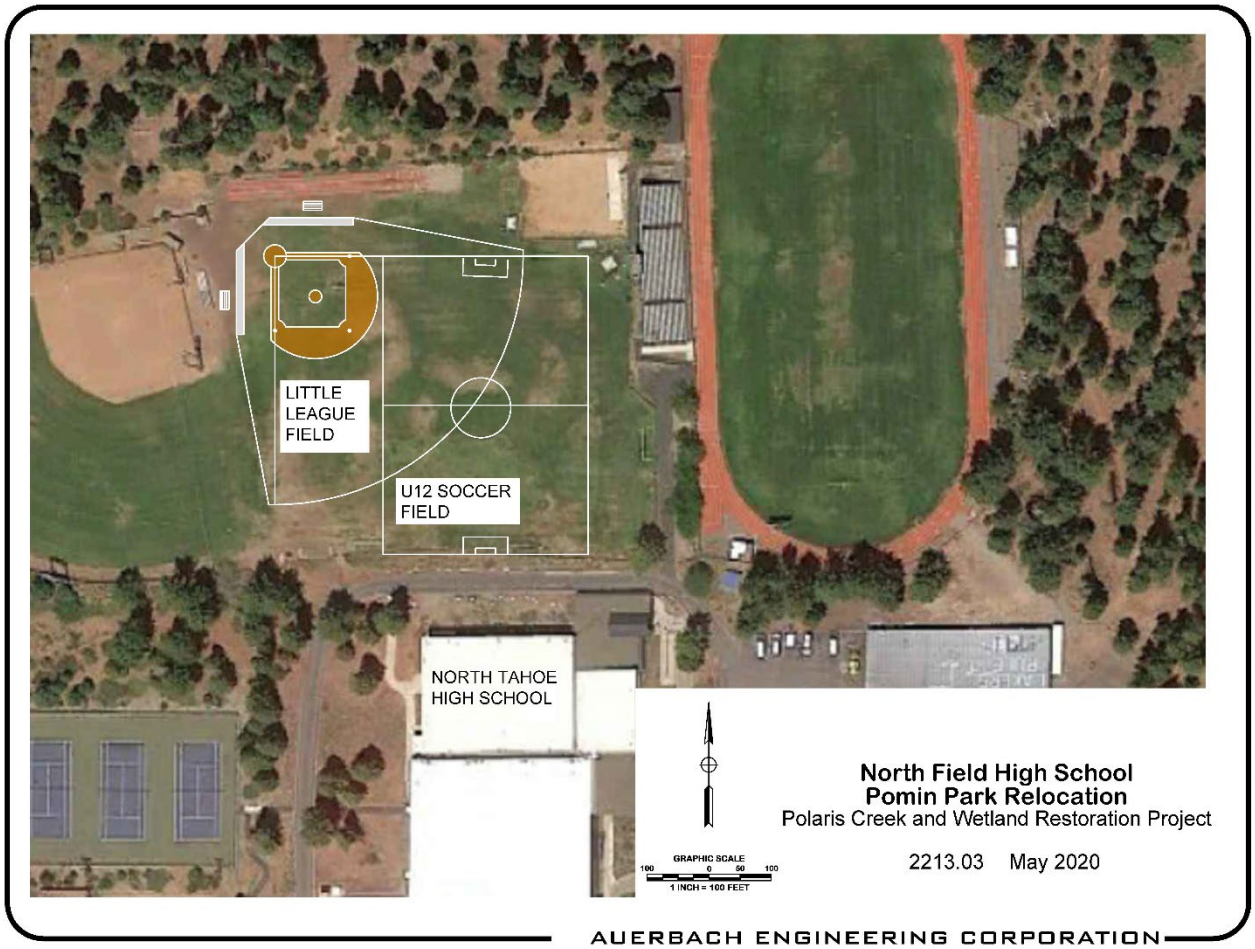

Figure 29. Athletic field relocation concept for North Field High School.

5.6.4 RIDEOUT SCHOOL

Figure 30 shows potential placement of the athletic fields and facilities at Rideout.

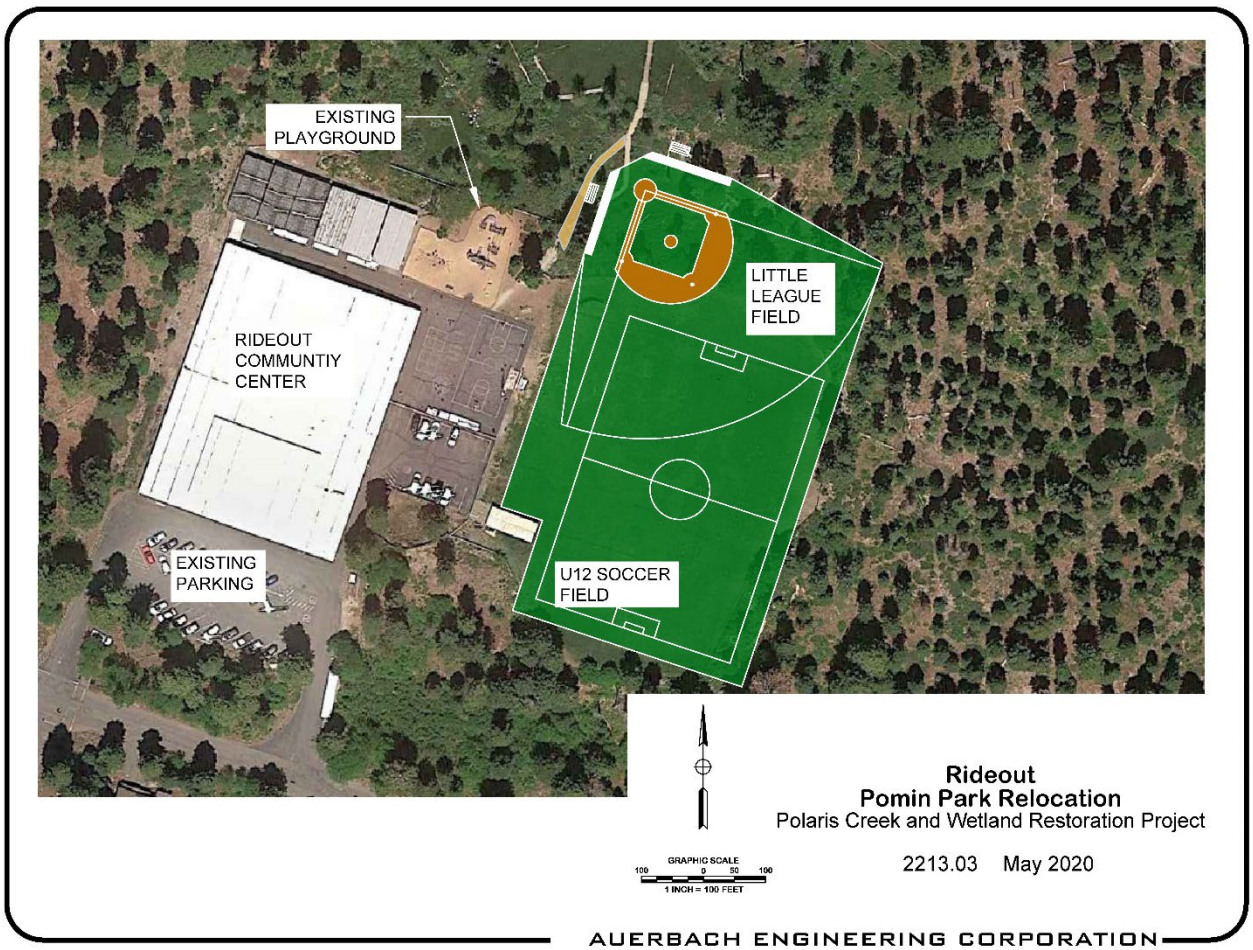

Figure 30. Athletic field relocation concept for Rideout School.

Opportunities

Rideout has existing parking and infrastructure in place. Much of the land for the fields is already disturbed and would only need renovation, but not clearing. There is an existing playground at this location.

Constraints

The location of the fields is low-lying, generally wet for most of the year, and is shaded by trees since the west shore receives less sun in the winter and spring due to the shadow of the hillside. This would affect use of the fields late spring despite the low elevation. This property is farther from Tahoe City and more difficult to access than the other relocation sites. There is no additional room to expand the fields at this location. The baseball and soccer fields would overlap, limiting use to one sport at a time. There is one SEZ feature (a 0.2-acre Riverine/Confined Channel area) that cuts the southeast corner of the site.

5.7 Public Outreach Results for Final Athletic Field Options

The public was engaged to collect input on the four final athletic field relocation sites. The results of that outreach are summarized below.

64-Acres North

Pros:

- Easy access and transportation options close to the transit center
- Low elevation is favorable for use of fields in the spring
- Lights at this location would not disturb neighbors
- Parking and bathrooms already in place

Cons:

- Parking would need to be addressed; currently used by rafters who take all the parking spots in the summer, but may not conflict with little league and soccer seasons
- Small area requires overlapping soccer and little league fields with limited buffer area

Firestone Property

Pros:

- Large property that would allow for expansion of recreational facilities and fields
- Potential for public pool and other amenities to this location

Cons:

- Traffic and congestion would be too high with other nearby development
- Close to the highway
- Turning in and out of this property from the highway would be dangerous
- Lights at this location could impact homeowners and would need to be limited

North Field High School

Pros:

- Parking and other infrastructure are already in place

Cons:

- American Youth Soccer Organization (AYSO) has had to move fields in recent years and has had challenging experiences trying to share fields with the high school
- There are existing traffic concerns and the field would add more vehicle trips
- Difficult to access from State Route 28 by bike or transit
- The elevation would limit seasonal use

Rideout School

Pros:

- Existing parking and infrastructure are already in place

Cons:

- Fields are shaded by trees and still under snow late in spring
- Access to the property is not good (furthest from downtown Tahoe City)
- There is no room to expand the fields at this location

5.8 Campground Relocation Options

Campground relocation analysis was not as robust as the analysis of the athletic fields due to fewer logistical hurdles associated with relocating the campground. The sites that were initially identified as possible relocation sites for the campground were as follows:

- Site 3 - 64-Acres East
- Site 5 - Tahoe SRA
- Site 7 - Lake Forest North
- Site 8 - Lake Forest South
- Site 9 - Lake Forest Glen
- Site 12 - Skylandia Park
- Site 14 - Firestone Property

The opportunities and constraints associated with each of these sites is summarized in Table 6 and are discussed further in the sections below. The boat-in campsites described as part of Design Element 3B are not discussed in this section since the harbor area is not large enough to accommodate all 20 of the sites at the current Lake Forest Campground.

Table 6. Summary of constraints and opportunities for campground relocation sites.

Campground Relocation Options							
Sites	**64- Acres East**	**Tahoe SRA**	**Lake Forest North**	**Lake Forest South**	**Lake Forest Glen**	**Skylandia Park**	**Firestone Property**
Opportunities							
Water trail access	x	x	x	x	x	x	
Close to utility infrastructure	x	x	x	x	x	x	x
Proximity to existing camping		x	x	x	x	x	
Constraints							
Nearby residences/Conflict with adjacent uses	x			x	x	x	x
Limited dimensionally				x	x		
Grade or access constraints			x	x	x		x
Incompatible with proposed uses							x
Potential Sensitive Lands		x				x	

5.8.1 64-Acres East

Figure 31 shows potential relocation of the campground at 64-Acres East. This site is located east of Highway 89, across the highway from the Tahoe City Transit Center.

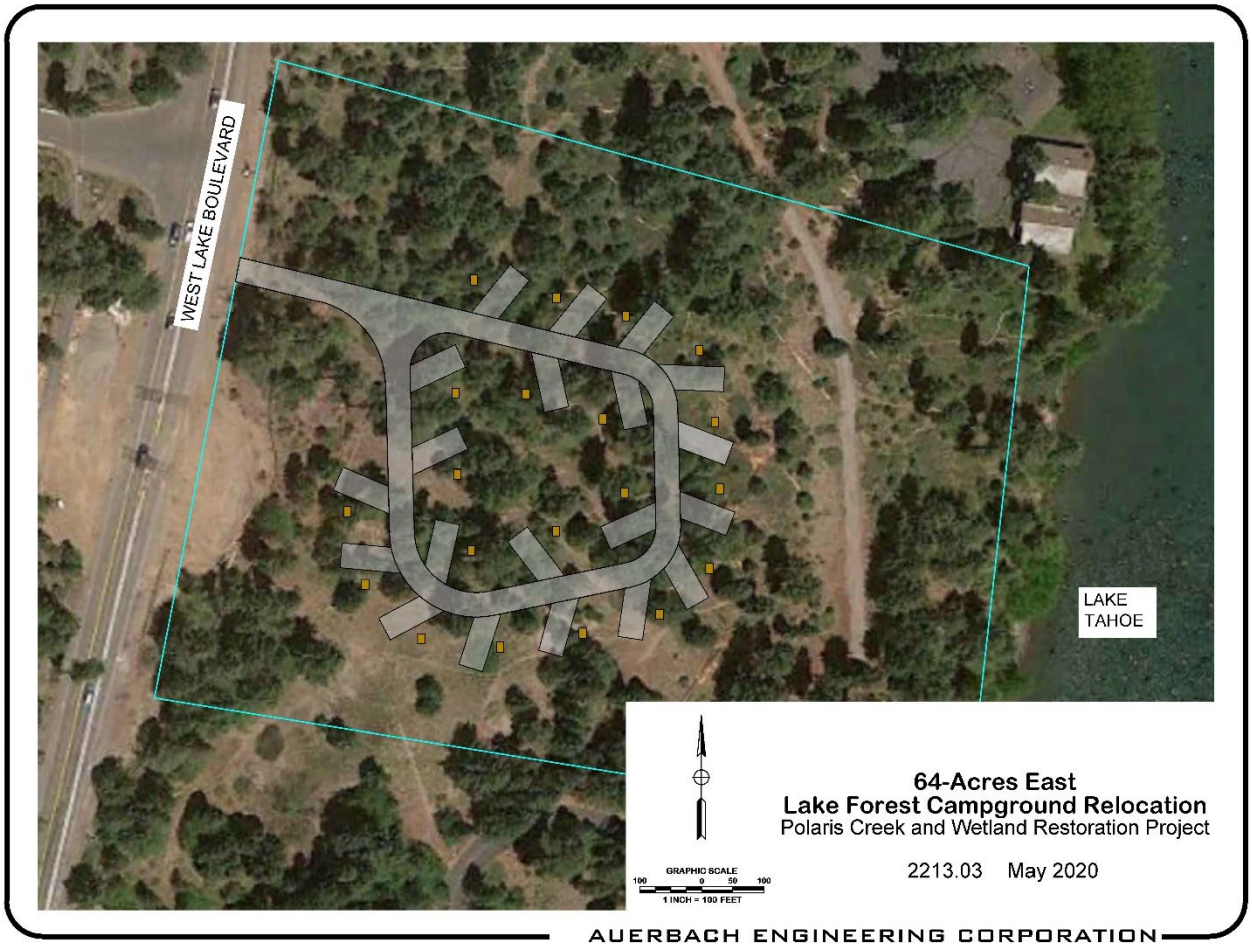

Figure 31. Campground relocation concept for 64-Acres East.

Opportunities

This site is level, has current access from Highway 89, and is located on Lake Tahoe which could allow for water trail access. Utility infrastructure is nearby in Highway 89. There is no mapped SEZ and no other apparent wetlands or waterways.

Constraints

This site is adjacent to residences. This site is owned by USFS, so federal approval would be required to develop this land. This site is adjacent to residences. Current uses of the site include public beach access, which may need to be maintained in a manner that doesn't conflict with the campground.

5.8.2 TAHOE STATE RECREATION AREA

Figure 32 shows potential relocation of the campground at Tahoe SRA. This location is across the Highway from the existing campground at the east end of Tahoe City.

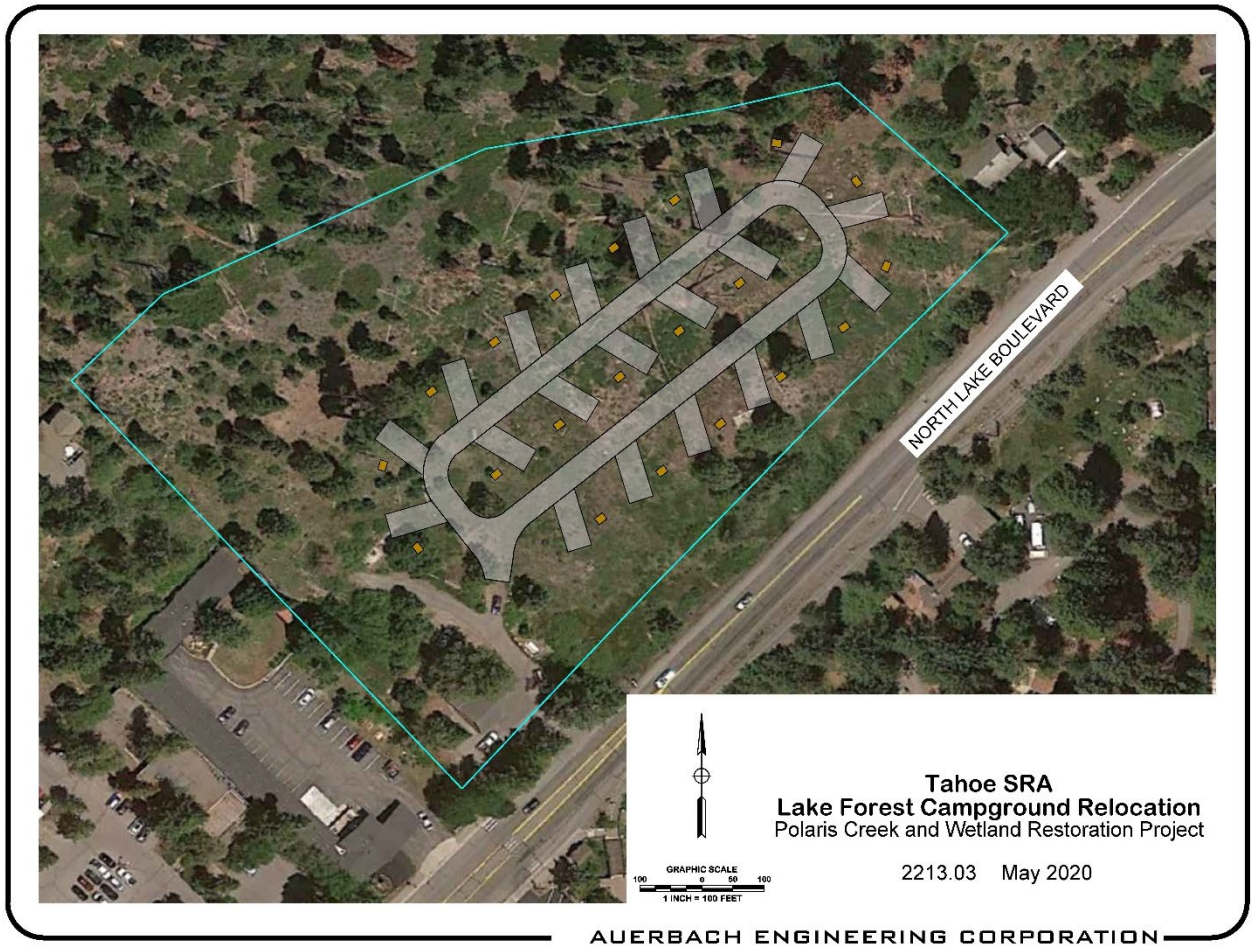

Figure 32. Campground relocation concept for Tahoe State Recreation Area.

Opportunities

The site is gently sloped along the southern side where the campground would be located. Access currently exists from Highway 28 to the State Parks offices, although further study is needed to establish that the access can serve more uses. Utility infrastructure exists in Highway 28. Pedestrian access exists to connect this site to Lake Tahoe for water trail access and to bike trails that connect to the Tahoe City commercial core. The site is located directly across the highway from the current Tahoe SRA campground, providing an opportunity for shared management. The current campground also has direct access to the Lake.

Constraints

This site is mapped as low capability land (the site includes a 1.6-acre area of Forested SEZ), but presents visually as less constrained and land capability should be verified. There may be conflicts with other planned land uses; the Burton Creek State Park General Plan (CSP, 2005) show the site as a proposed trailhead. State Route 28 would need to be widened to extend the existing turning lanes. Highway work of this nature can be costly.

5.8.3 LAKE FOREST NORTH

Figure 33 shows potential relocation of the campground at Lake Forest North.

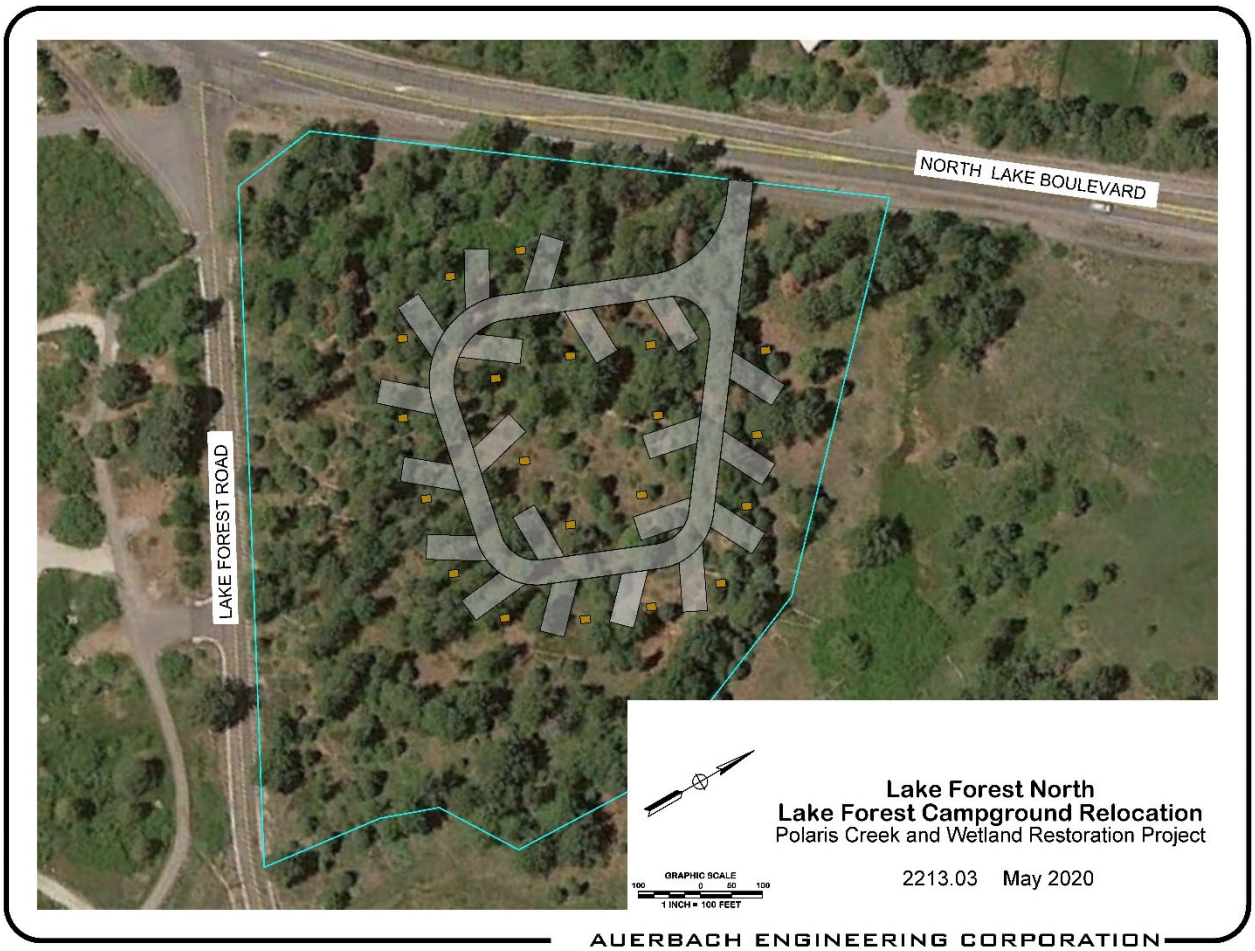

Figure 33. Campground relocation concept for Lake Forest North.

Opportunities

This location is adjacent to the existing campground in Lake Forest and is close enough to the Lake to facilitate water trail access. Some utility infrastructure exists within Lake Forest Road and along Highway 28. The site is close to bike trails that connect to the

Tahoe City commercial core. There is no mapped SEZ or other apparent wetlands or waterways.

Constraints

This site is somewhat constrained by topography, land capability and access. There are steep grades along the frontage of Lake Forest Road, so access to this site would best be accomplished from Highway 28. This would likely require extension of the existing turn lane, which can be costly.

5.8.4 LAKE FOREST SOUTH

Figure 34 shows potential relocation of the campground at Lake Forest South. This is State-owned land located in a residential area south of Lake Forest Road and east of the Coast Guard Station.

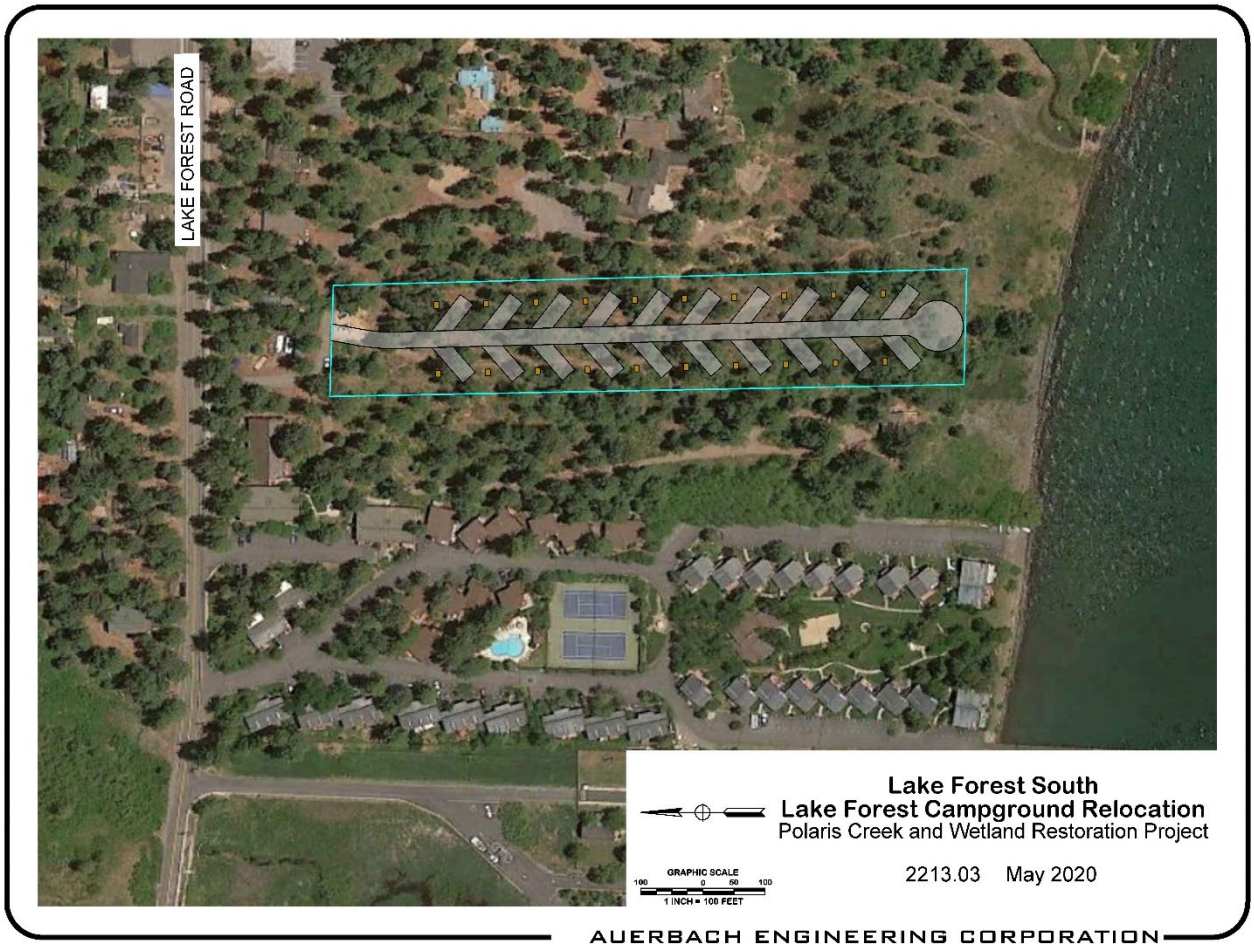

Figure 34. Campground relocation concept for Lake Forest South.

Opportunities

The site is near the existing campground and would allow for water trail access to Lake Tahoe. Utility infrastructure is available in Lake Forest Road and along the shoreline (sewer). There is no mapped SEZ or other apparent wetlands or waterways.

Constraints

Access to this site is limited by an easement through private property. The site is adjacent to lakefront residences, and the use may not be compatible with the allowed uses in the portion of the Placer County Area Plan. Given the topography and the dimensions of the property, the site configuration is not ideal for the proposed use.

5.8.5 LAKE FOREST GLEN

Figure 35 shows potential relocation of the campground at Lake Forest Glen. This site is a forested strip of land on the south side of Highway 28 north of Lake Forest Glen condominiums.

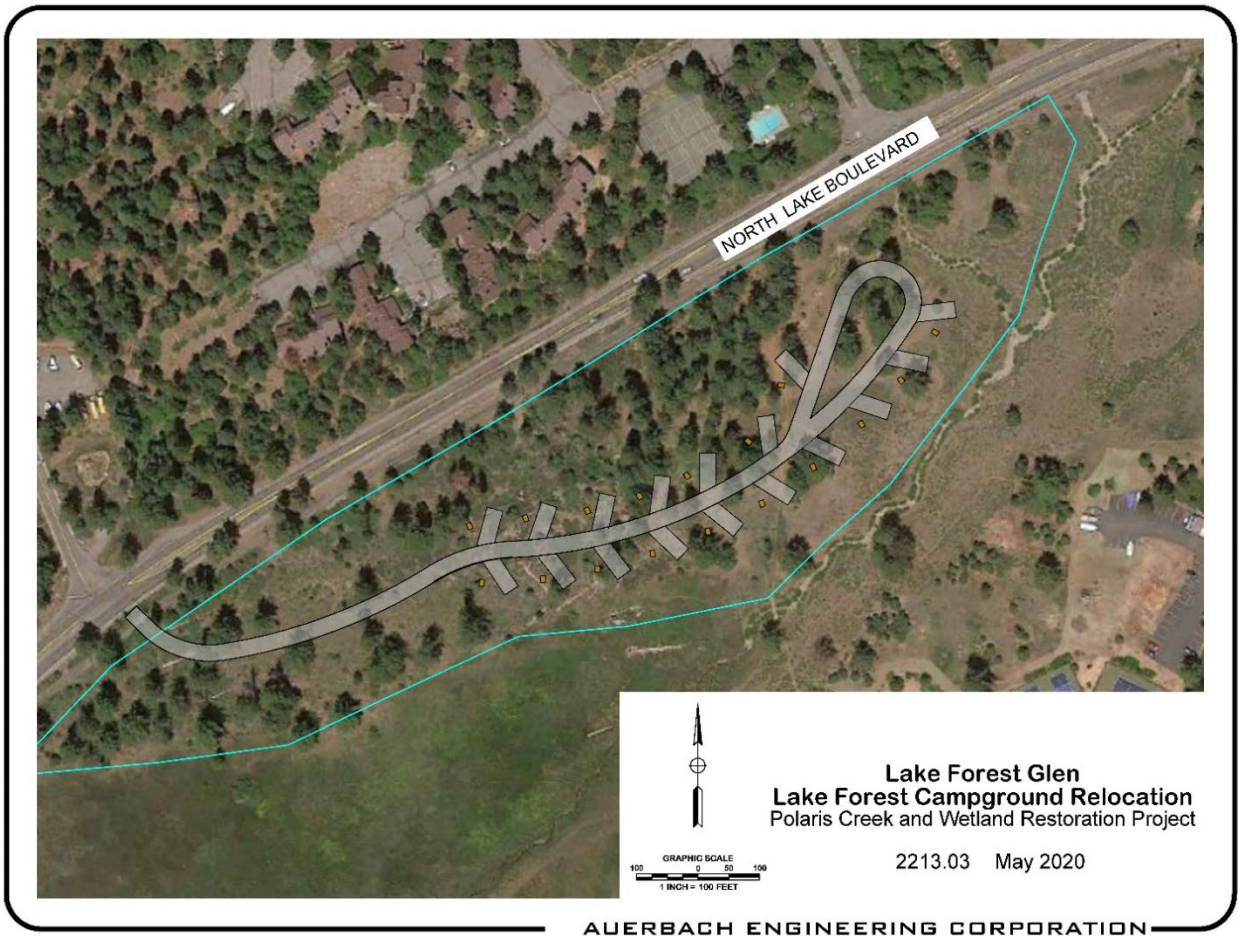

Figure 35. Campground relocation concept for Lake Forest Glen.

Opportunities

The site is proximate to some utility infrastructure in Highway 28. Access to the water could be provided through new pedestrian linkages to Lake Tahoe. The site is close to bike trails that connect to the Tahoe City commercial core. There is no mapped SEZ within the site.

Constraints

The site configuration is not ideal for the proposed use. New access would be needed from Highway 28. Nearby springs and streams imply high groundwater levels which may complicate the site design and limit excavation depths.

5.8.6 Skylandia Park

Figure 36 shows potential relocation of the campground at Skylandia Park. The site is located in the northern portion of the park.

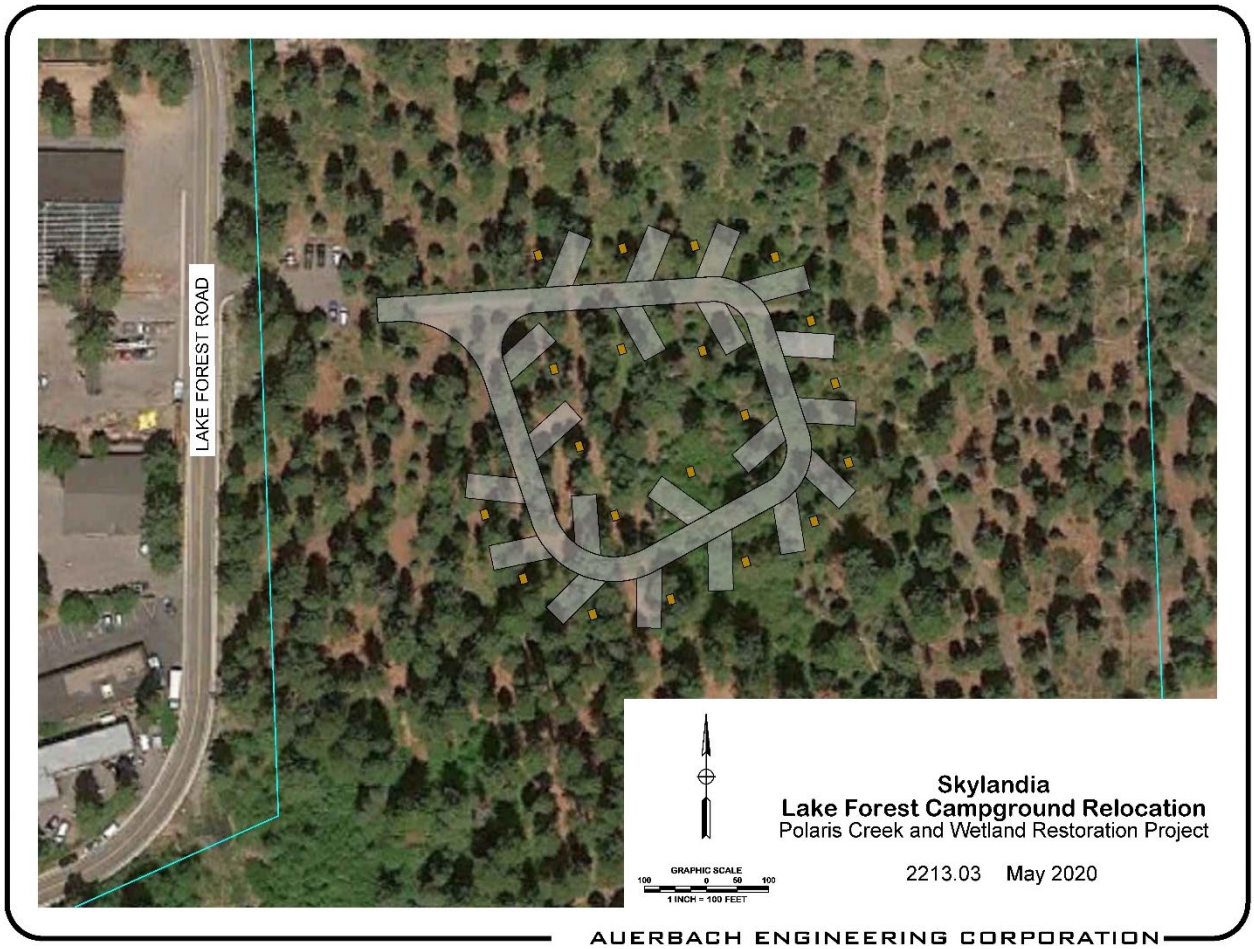

Figure 36. Campground relocation concept for Skylandia Park.

Opportunities

This site is near the existing Lake Forest Campground, and is large enough to accommodate the proposed use. It is proximate to existing utilities in Lake Forest Road. There are existing trails and public access to Lake Tahoe at this location (including a pier), which would accommodate water trail access. There is existing access from Lake Forest Road which could be improved to accommodate the proposed use. There is likely adequate room to design a campground that could maximize distance to adjoining uses that may not be compatible.

Constraints

This site is adjacent to residences on the north side, is relatively distant from existing residences on the east side, and across Lake Forest Road from commercial and industrial uses. The site is owned by California State Parks but is under management of the Tahoe City PUD, who currently uses Skylandia Park for kids' programs during the summer months. More than half of the site is mapped as various types of SEZ (Forested, Meadow, Seep/Spring, and Riverine/Confined Channel). There are also substantial wetland constraints, although approximately 15 acres of the site is upland forest which could be suitable for a campground.

5.8.7 FIRESTONE PROPERTY

Figure 37 shows potential relocation of the campground at Firestone. This portion of the Firestone site is located on the eastern side of the property, adjacent to the old highway alignment and to the east of the proposed field relocation at the same property.

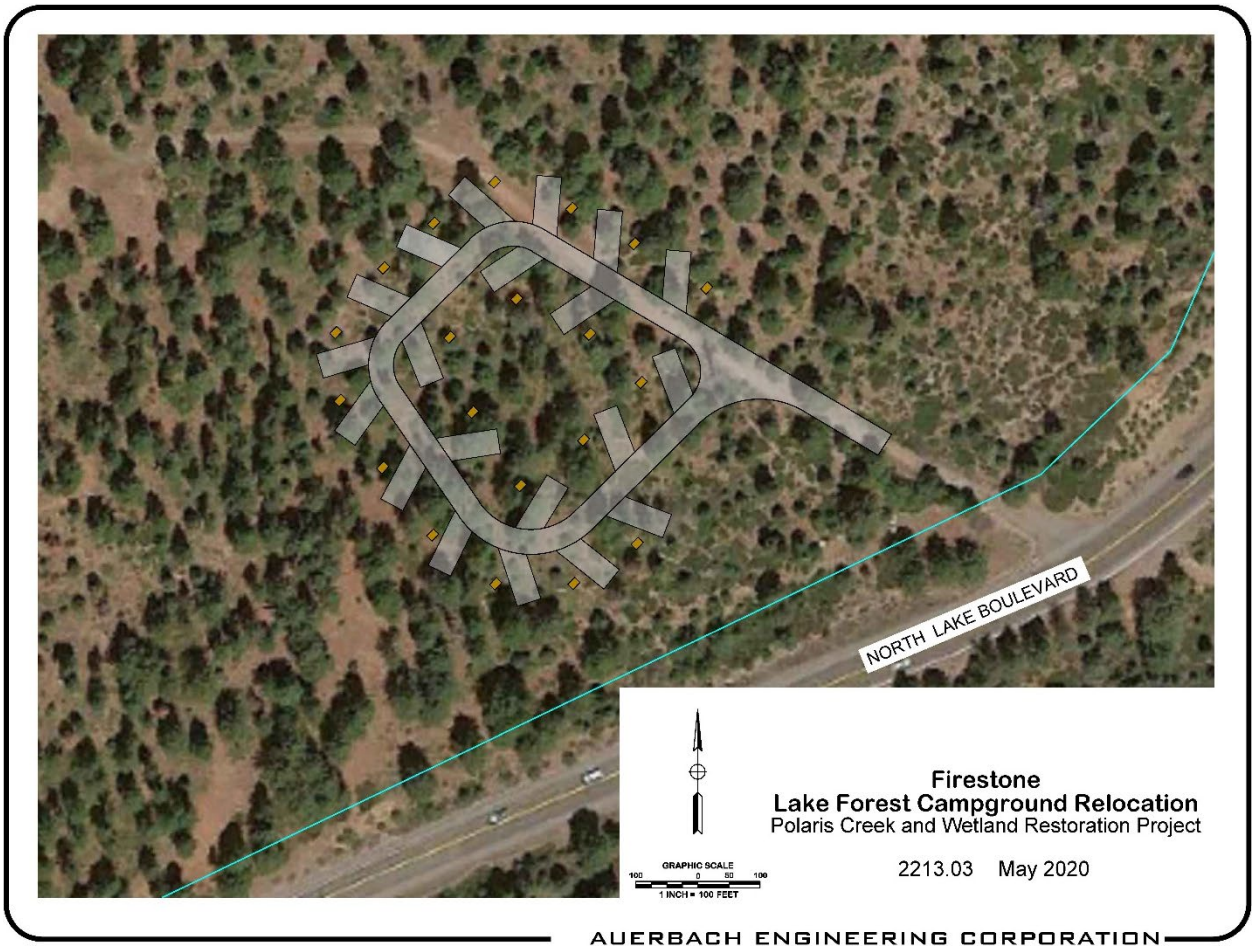

Figure 37. Campground relocation concept for Firestone Property.

Opportunities

This site is somewhat remote and separated from existing residential uses. There is easy access to existing trails. Access to this location (and other locations within the Firestone property) may also be possible at the same point as the proposed athletic fields, where access already exists. Water infrastructure exists nearby. There is one mapped SEZ feature located along the eastern boundary of the site (a 0.1-acre area of Riverine/Channel), but it is more than 500 feet away from the nearest campsite shown in Figure 38.

Constraints

If access is required from the highway, it would occur on a steep portion of roadway at an oblique angle. A turn lane would be needed at significant cost and likely difficult to approve with Caltrans. No sewer access is readily available here for a restroom. This site would not have water trail access.

6 REGULATORY CONSIDERATIONS

The implementation of the various components of this project will involve numerous local, state and federal regulatory programs. Additionally, the environmental effects of the project will need to be evaluated through the California Environmental Quality Act (CEQA), TRPA Environmental Documentation Program, and the National Environmental Policy Act (NEPA). Due to the location of the project within the Tahoe Basin, the regulatory requirements that will apply to a future project description will be subject to land use and water quality requirements that are different and more stringent than other areas of California.

The first portion of the regulatory discussion will focus on environmental review for projects subject to CEQA, TRPA Environmental Documentation, and NEPA. While these programs are not regulatory, they provide the foundation for future regulatory actions of decision-makers. The balance of the discussion will focus on the likely regulatory requirements that would apply to one or more project elements[5]. Lastly, a summary of potential regulatory requirements for each project element is included as Appendix F.

6.1 Environmental Review

The environmental effects from the implementation of project elements will be evaluated by CEQA, NEPA, and the TRPA Environmental Documentation program. The requirements of each are similar and it is common for a joint document to be prepared to satisfy all three. The environmental effects of the restoration project and the development of a new recreation facilities (athletic fields and/or campground) would be evaluated as one project.

6.1.1 CEQA

The California Legislature enacted CEQA in 1970 (Public Resources Code 21000-21189). CEQA recognizes the importance of input from public agencies that have "jurisdiction by law" over natural resource areas and requires public agencies to consider and disclose the environmental effects of a project to the public. In addition to the Public Resources Code CEQA statue, the California Code of Regulations has a set of comprehensive regulations known as the CEQA Guidelines that must be followed by all state and local agencies in the implementation of CEQA (California Code of Regulations,

[5] The Regulatory Considerations Section refers restoration at Pomin Park, relocation of the athletic field, and relocation of the campground collectively as "project elements" since all would be subject to a similar set of regulatory requirements.

Title 14, Division 6 Chapter 3, § 15000 to 15387). Numerous local and state agencies have responsibilities under CEQA based upon their regulatory oversight or their ability to carry out projects. CEQA and the CEQA Guidelines identify three types of agencies and their roles in preparing CEQA documents and carrying out or approving projects.

- Lead agency – is the public agency that has the primary responsibility for carrying out or approving a project (CEQA Guidelines § 15367). The Lead Agency will decide on what level of documentation—Environmental Impact Report (EIR), Negative Declaration, Mitigated Negative Declaration, or exemption—will be required for the project and will cause the document to be prepared. A private individual or organization cannot be the lead agency.
- Responsible agency – is a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration. (CEQA Guidelines § 15381).
- Trustee agency – a trustee agency is State agency having jurisdiction by law over natural resources that are held in trust for the people of California. (CEQA Guidelines §15386).

There are circumstances where more than one state or local agency will carry out or approve a project which can lead to a question of who the lead agency is. The CEQA Guidelines (§ 15050-15053) provides specific guidance on determining who will be the lead agency and who will be a responsible agency.

As noted above, CEQA only applies to land use activities that are approved or carried out by a local or state agency. For some projects, state or local agencies will only have ministerial authority over the project (e.g., issuance of a building permit or approval of individual utility service connections). These projects are considered ministerial and are considered statutorily exempt from CEQA (CEQA Guidelines § 15268).

Many projects are not ministerial under a public agency's statutes and ordinances, but they do not have a significant effect on the environment. The CEQA Guidelines includes a list of classes which have been determined not to have a significant effect on the environment. These classes of projects are categorically exempt from the provisions of CEQA. There are 33 classes defined in the CEQA Guidelines (§ 15301 through 15333) including some that could be applicable to one or more project elements, for instance, Class 16 – Transfer of Ownership of Land in Order to Create Parks, Class 17 – Open Space Contracts or Easements and Class 33 – Small Habitat Restoration Projects (projects less than 5 acres in size).

If a project is not statutorily or categorically exempt from CEQA, it will be necessary for the lead agency to prepare an initial study. The initial study serves a number of purposes as outlined in the CEQA Guidelines (§ 15063) including:

- Provide the lead agency with information to use as the basis for deciding whether to prepare an EIR or negative declaration;
- Enable an applicant or lead agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a negative declaration;
- Assist in the preparation of an EIR, if one is required, by: (1) Focusing the EIR on the effects determined to be significant, (2) Identifying the effects determined not to be significant, (3) Explaining the reasons for determining that potentially significant effects would not be significant, and (4) Identifying whether a program EIR, tiering, or another appropriate process can be used for analysis of the project's environmental effects.
- Facilitate environmental assessment early in the design of a project;
- Provide documentation of the factual basis for the finding in a negative declaration that a project will not have a significant effect on the environment;
- Eliminate unnecessary EIRs;
- Determine whether a previously prepared EIR could be used with the project.

An initial study includes an environmental checklist (CEQA Guidelines Appendix G) that has several elements including a project description, environmental setting, and an evaluation of environmental effects. The analysis of environmental effects will guide the decision-maker on what type of environmental review is required and what mitigation measures are to be incorporated into the project. Each topical area that is examined (e.g., air quality, aesthetics, noise) will focus on whether the project will:

- Have a potentially significant impact on the environment;
- Have a less than significant impact on the environment with mitigation incorporated;
- Have a less than significant impact on the environment; or
- Have no environmental impact.

Additionally, the initial study includes mandatory findings of significance resulting from the project on the environment, including cumulative effects, and direct or indirect effects on human beings.

The above conclusions about the level of significance of the project's impacts will determine the type of environmental document that will need to be prepared by the lead agency based on the following determinations:

- The project could not have a significant effect and a negative declaration is to be prepared.
- The project could have a significant effect on the environment but revisions to the project have been made by or agreed to by a project applicant which reduces effects to a less than significant level. A mitigated negative declaration is to be prepared.
- The project may have a significant effect on the environment and an Environmental Impact Report (EIR) is required.
- The project may have a potentially significant effect, or potentially significant effect unless mitigated, but at least one effect 1) has been adequately analyzed in an earlier document and 2) has been addressed by mitigation measures based on the earlier analysis. An EIR is required but it must analyze only the effects that remain to be addressed.
- The project could have a significant effect on the environment, but all potentially significant effects 1) have been analyzed adequately in an earlier EIR or Negative Declaration and 2) have been avoided or mitigated pursuant to that earlier EIR or Negative Declaration, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

When a decision-maker is considering a discretionary project or preparing to carry out a project, they must consider the environmental effects of the project as described by the environmental document that was prepared.

6.1.2 NEPA

At nearly the same time that CEQA was being enacted in California, the federal government adopted NEPA (Public Law 91-190 effective January 1, 1970). NEPA was

enacted for several reasons including the establishment of the Council on Environmental Quality, the establishment of national policy on the environment, and a requirement for Federal agencies to assess the environmental effects of proposed Federal actions prior to making decisions.

Similar to CEQA, NEPA describes a lead agency as the agency with "primary responsibility for preparing the environmental impact statement" (40 CFR § 1508.16), or Environmental Assessment (EA). NEPA allows agencies to share the lead role as co-leads and as cooperating agencies. A project may qualify for a Categorical Exclusion if the project does not individually or cumulatively have a significant effect on the human environment (40 CFR 1508.4). If a Categorical Exclusion does not apply, an EA will need to be completed to determine whether the Federal action significantly affects the quality of the human environment. The EA leads to one of three decisions after the public is given an opportunity to comment on the draft EA:

- Preparation of a Finding of No Significant Effect to explain the reasons why the federal action will not have a significant effect on the human environment
- Preparation of a Mitigated Finding of No Significant Effect to explain the reasons why the federal action, with mitigation incorporated, will not have a significant effect on the human environment
- Preparation of an Environmental Impact Statement (EIS) when then federal action significantly affects the quality of the human environment

If an EIS is prepared, the Federal agency responsible for carrying out the project must review the final EIS before reaching a decision on the project. Once a decision is reached, a Record of Decision is issued. For projects that require an EIR under CEQA and an EIS under NEPA it is common for state/local and federal agencies to prepare a joint EIR/EIS. If TRPA is preparing an EIS for the same project, it is also possible that an EIR/EIS/EIS (e.g., County CEQA/Federal EIS/TRPA EIS) would be prepared.

6.1.3 TRPA Environmental Documentation Program

TRPA is the lead agency pursuant to the Tahoe Regional Planning Compact (Public Law 96-551), 1980 revision (the Compact), Code of Ordinances, and Rules of Procedure to examine the environmental effects of projects subject to TRPA's discretionary review and approval process. If a project is not delegated to Placer County for permitting, it will be necessary for an applicant to comply with TRPA's environmental documentation program (Chapter 3 – *Environmental Documentation* of the TRPA Code of Ordinances).

As required by the Compact, TRPA must prepare an Environmental Impact Statement (EIS) for projects that may have a significant effect on the environment before deciding to approve or carry out any project. Certain land use activities are considered exempt from the requirement to prepare an EIS when it has been determined that the project will not have a significant effect on the environment (e.g., construction of a single-family home).

Similar to Placer County's application process for CEQA, an applicant must submit an initial environmental checklist (IEC) as part of their project application materials. The checklist is a preliminary examination of the potentially significant environmental effects of the project including the disclosure of proposed mitigation measures that could reduce effects to a less than significant level. More substantive projects may be required to submit an Environmental Assessment in lieu of the IEC. Following the review of the IEC or the Environmental Assessment, TRPA will reach one of three conclusions:

1. The proposed project could not have a significant effect on the environment and a Finding of No Significant Effect is prepared;
2. The proposed project could have a significant effect on the environment but, due to the proposed mitigation measures, the project could have not significant effect and a Mitigated Finding of No Significant Effect is prepared; or
3. The proposed project may have a significant effect on the environment and an EIS is to be prepared.

An EIS must be prepared pursuant to the requirements of Section 3.7 of the Code of Ordinances. The key elements of the EIS include:

- A disclosure of the significant environmental effects of the project;
- A list of any significant environmental effects that cannot be avoided;
- An evaluation of alternatives;
- A list of mitigation measures that must be implemented;
- An evaluation of the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity;

- An evaluation of significant and irreversible and irretrievable commitments of resources that would be involved in the proposed project if it was implemented; and
- An evaluation of the growth-inducing impact of the proposed project.

Once an EIS is prepared, TRPA will disclose the project to the public and invite public comments for a minimum of 60 days. Prior to approving a project for which an EIS is to be prepared TRPA must make one of two findings for each of the significant adverse effects identified in the EIS:

1. Changes or alterations have been required in or incorporated into the project that avoid or reduce the significant adverse environmental effects to a less than significant level; or
2. Specific considerations, such as economic, social, or technical, make infeasible the mitigation measure or project alternatives discussed in the EIS.

When a CEQA lead agency determines that an EIR is to be prepared, frequently that EIR will be prepared as a joint document with the TRPA EIS. If there is a federal lead agency preparing an EIS pursuant to NEPA, it is also possible that the joint document would be prepared for all three agencies (i.e., an EIR/EIS/EIS).

6.2 Local Government

The local government that has regulatory oversight over implementation of many of the project elements is the County of Placer. While other local government entities exist with service area boundaries that include the various project elements (e.g., special districts and school districts), only Placer County has the police power authority over land use that is vested in local government. While the Tahoe Regional Planning Agency (TRPA; discussed below) has land use authority inside the Tahoe Basin, the agency is not considered a form of local government as that term is defined by the State Constitution and Government Code. Lastly, project elements on land owned by state agencies such as CSP and CTC are exempt from County permit requirements.

Placer County's land use regulatory program is found in numerous chapters of County Code. The key chapters include Chapters 12 (Roads, Highways and Public Places), 13 (Public Services), 15 (Building and Development), 16 (Subdivisions), 17 (Zoning), and 18 (Environmental Review). Because the project elements are found in the Tahoe Basin, additional regulations are found in the Placer County Tahoe Basin Area Plan Implementing Regulations that were jointly adopted by the Board of Supervisors in 2016

and TRPA Governing Board in 2017. The land use designations of the Pomin Park and the surrounding areas include:

- Greater Tahoe City Plan Area – Recreation
- Fish Hatchery Subdistrict – Recreation
- Placer County Tahoe Basin Area Plan Zoning Map – Recreation

The *Recreation* zoning designation lists several uses associated with the current and potential future use of the Pomin site including:

- Day Use Areas
- Developed Campgrounds (conditional use permit required)
- Beach Recreation
- Riding and Hiking Trails (minor use permit required)
- Nonstructural fish and wildlife habitat management
- Structural fish and wildlife habitat management (minor use permit required)
- Sensitive plant management
- SEZ restoration
- Runoff control

The Placer County Tahoe Area Plan and its Implementing Regulations should be consulted for the individual offsite locations for the campground and/or ball field relocations.

In addition to its regulatory authority, Placer County is typically a lead agency under CEQA to examine the environmental effects of projects subject to the County's discretionary review and approval process for land use (Chapter 18 Environmental Review of the Placer County Code).

Placer County Air Pollution Control District

The Placer County Air Pollution Control District (APCD) is one of 35 local air pollution control agencies in California. They have local air pollution control Rules that are

adopted by the APCD's Board of Directors. The construction of the various project elements could result in the need for permits (e.g., an Authority to Construct permit), Construction Emission/Dust Control plans or compliance with air quality standards required by the District's Rules.

In addition to its regulatory authority, the APCD is typically a responsible agency under CEQA to examine the air quality impacts of a project. The APCD typically assists the lead agency with an evaluation of a project's effects on air quality and will recommend mitigation measures and conditions of approval for discretionary projects.

6.3 Tahoe Regional Planning Agency

The TRPA is a unique regulatory agency with authority over land use in California and Nevada within the watershed of Lake Tahoe. TRPA was created in 1969 by a Bi-State Compact with jurisdiction over land use activities in Placer, El Dorado, Washoe and Douglas Counties and the City of South Lake Tahoe. Through this Compact, the Tahoe Basin "Region" was identified, a Governing Board was created, and the TRPA was established and vested with land use authority to create and implement a Regional Plan. Several ordinances, rules and regulations have subsequently been adopted to "effectuate" the adopted Regional Plan including the TRPA Code of Ordinances. Additionally, local governments within the Tahoe Basin have the option to prepare and adopt Area Plans that are implemented at the local level. As described above, Placer County and TRPA adopted the Placer County Tahoe Basin Area Plan. This Area Plan was adopted by Placer County on December 6, 2016 and by the TRPA Governing Board on January 25, 2017

Through an adopted Area Plan, TRPA can delegate land use permitting authority for specified land uses to local government through a memorandum of understanding (MOU). In 2017, a MOU was executed between Placer County and TRPA which includes a long list of land uses that have been delegated to Placer County for permitting (See Placer County Board Resolution 2017-143). The MOU has exceptions including projects requiring an Environmental Impact Statement (EIS) or development within the Shorezone of Lake Tahoe. These projects and others listed in the MOU must be permitted at TRPA. Notably, large and small recreation projects, as defined by the MOU, may be processed at Placer County without a permit being required from TRPA if an EIS is not required. Once a final project description has been prepared it will be necessary to consult with the TRPA and Placer County to determine whether the land use authority has been delegated to Placer County or if it is retained by TRPA.

If discretionary land use authority has been delegated to Placer County, a minor use permit or conditional use permit will typically be required for new recreational facilities and the campground. If discretionary land use authority has not been delegated to Placer County, TRPA will require a permit consistent with the TRPA Code of Ordinances (Chapter 2, § 2.2 – Project Review). Typically, any amount of disturbance in excess of 7 cubic yards of material will not be an Exempt Activity or Qualified Exempt Activity as defined by TRPA. It is also unlikely that any of the project elements will qualify for TRPA Express Check Permitting Program due to the scope and scale of a future project. At a minimum a grading permit would be required by TRPA for restoration, the construction of a campground at a new location or the construction of new recreational facilities at a new location.

TRPA's environmental review requirements are described in Section 6.1.3 above.

6.4 State of California

The State of California's regulatory oversight is primarily found in four state agencies, the Regional Water Quality Control Board – Lahontan Region (Lahontan), the California Department of Fish and Wildlife (CDFW), the California Water Resources Control Board (Water Board) and California Department of Forestry and Fire Protection (Cal Fire).

6.4.1 California Department of Fish and Wildlife

The project is located CDFW Region 2 – North Central Region which is one of seven geographically-defined administrative regions headquartered in Rancho Cordova. CDFW's regulatory oversight includes incidental take permits for listed California Endangered Species Act (Fish and Game Code § 2081), CEQA review as a trustee and responsible agency, Lake and Streambed Alteration Agreements (Fish and Game Code § 1602), timber harvesting plan reviews (California Forest Practice Rules), and Habitat Restoration and Enhancement Act approvals. For the project elements there is a potential for impacts to state listed sensitive species and impacts to rivers, streams or lakes depending upon the final project description and project location.

- *Incidental* Take (Fish and Game Code § 2081(b)). There is a potential for one or more projects to need a consultation under the California Endangered Species Act (CESA) and issuance of take authorization if the final project description(s) identify the potential to impact state listed endangered fish and wildlife. Unlike the federal ESA, CESA also requires an incidental take permit for rare plants.

- *Lake and Streambed Alteration Agreements* (Fish and Game Code § 1602). A private person or organization, public agency, or public utility must notify CDFW prior to beginning any of the following activities:
    - Divert or obstruct the natural flow of any river, stream, or lake;
    - Change the bed, channel, or bank of any river, stream, or lake;
    - Use material from any river, stream, or lake; or
    - Deposit or dispose of material into any river, stream, or lake.

If any of the above activities have the potential to substantially adversely affect fish and wildlife resources a Lake and Streambed Alteration Agreement will be required. The CEQA document prepared by the lead agency will typically support CDFW's action as a responsible agency on a Lake and Streambed Alteration Agreement.

6.4.2 California Water Resources Control Board

In 2019, the Water Board adopted a statewide definition of what constitutes a wetland and when a wetland is considered a water of the state subject to regulation by the State. The Water Board also adopted procedures for the discharge of dredged or fill material into a wetland. These procedures will take effect on May 28, 2020.

In February of 2020, the Water Board released a draft guidance document for the "State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State". These guidelines will provide applicants with assistance on meeting the Water Board's new Procedures including the preparation of delineations for waters of the state, permit requirements, alternatives analysis, compensatory mitigation requirements and climate change assessments. It is possible that implementation of a future project will have impacts to waters of the state in addition to WOUS and compliance with the new Procedures will be required. The Lahontan Regional Water Quality Control Board will have the responsibility for implementing the new Procedures for the project elements.

6.4.3 Lahontan Regional Water Quality Control Board

Lahontan is responsible for establishing water quality standards and control measures for surface and ground waters in the Lahontan Region in the Lahontan Basin. Lake Tahoe is in the North Lahontan Basin. Lahontan's local storm water regulations originate from federal regulations that began in 1987 when the Clean Water Act (CWA) was amended by the Water Quality Act to formally include storm water runoff. Congress subsequently authorized the U.S. Environmental Protection Agency to administer the National Pollutant

Discharge Elimination System (NPDES) program and issue storm water permits to municipalities regulating storm water discharges. This authority was delegated from EPA to the California State Water Resources Control Board (SWRCB) and associated Regional Water Quality Control Boards (RWQCBs) including Lahontan.

Additionally, under federal Clean Water Act (CWA) § 401, applicants for a federal permit for activities which may result in a discharge to a water body must obtain a State Water Quality Certification to ensure that the proposed activity will comply with state water quality standards. Most Certifications are issued in connection with U.S. Army Corps of Engineer (USACE) CWA § 404 permits for dredge and fill discharges into waters of the U.S. (WOUS). Any request for a Nationwide Permit or other permit issued by the USACE for habitat restoration or the construction of new recreational facilities or campgrounds will need a § 401 Certification from Lahontan.

Lahontan is also responsible for issuing NPDES permits in the Tahoe region. NPDES Municipal Separate Storm Sewer System (MS4) Permits require municipalities to implement a variety of programs to prevent pollution, improve and protect storm water quality, reduce storm water runoff, and enhance the ecologic vitality of local creeks and waterways. MS4 Permits also require that municipalities regulate new development and redevelopment projects within their jurisdiction.

Storm water discharges in the Lake Tahoe Hydrologic Unit are regulated by a separate construction permit adopted by the respective California Regional Water Quality Control Board and are not available for coverage under the State Water Resources Control Board's General Permit.

6.4.4 CAL FIRE

The primary regulatory responsibility of California Department of Forestry and Fire Protection (CAL FIRE) over one or more of the program elements would be the review of timber harvest plans if one was required (e.g., construction of a new ball field results in the extraction of timber that is commercially sold).

6.4.5 CALIFORNIA STATE LANDS COMMISSION

The State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce,

navigation, fisheries, water-related recreation, habitat preservation, and open space. A Memorandum of Understanding (MOU) between TRPA and the California State Lands Commission outlines procedures for permitting coordination within the shoreline of Lake Tahoe. The MOU divides the bed of Lake Tahoe into two zones: (1) the lake bed up to the natural rim elevation (i.e. low-water mark) of 6,223 feet (per the U.S. Bureau of Reclamations Lake Tahoe Datum) are owned by the State and are considered State Sovereign Lands, and (2) from the low-water mark to the ordinary high-water mark 6228.75 feet (Lake Tahoe Datum) are within a public trust easement, wherein legal public access and recreation opportunities must be preserved. The California State Lands Commission meets the CEQA definition for a trustee agency with respect to resources potentially affected by the project elements.

6.5 Federal

The federal government's regulatory oversight is limited to the U.S. Army Corps of Engineers (USACE) and the U.S. Fish and Wildlife Service (USFWS) for potential impacts to wetlands and endangered species.

6.5.1 U.S. Army Corps of Engineers

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into WOUS, including wetlands. The USACE has been delegated the authority to administer a permitting program for projects that impact WOUS. The USACE permitting program includes several types of permits including some that are unique to a particular discharge type, a particular geographic region, or a threshold of effects. The broad categories of USACE CWA § 404 permits include:

- *Individual permits* – Individual permits include Standard Permits for larger more complex projects and Letters of Permission. A Letter of Permission is used for projects that are minor, would not have significant individual or cumulative impacts on environmental values, and should encounter no appreciable opposition.
- *General permits* – General permits include, Nationwide Permits, Regional General Permits and Programmatic General permits. For the project elements it is possible that impacts to WOUS can be addressed through two or more Nationwide Permits. The two Nationwide Permits that have direct applicability to the project elements include the following:

- *Nationwide Permit 27 Aquatic Habitat Restoration, Enhancement, and Establishment Activities.* This permit applies to activities in WOUS associated with the restoration, enhancement, and establishment of non-tidal wetlands and riparian areas, the restoration and enhancement of non-tidal streams and other non-tidal open waters, provided those activities result in net increases in aquatic resource functions and services.
- *Nationwide Permit 42 Recreational Facilities.* This permit applies to discharges of dredged or fill material into non-tidal WOUS for the construction or expansion of recreational facilities. Examples of recreational facilities include playing fields (e.g., football fields, baseball fields), basketball courts, tennis courts, hiking trails, bike paths, golf courses, ski areas, horse paths, nature centers, and campgrounds. In order to qualify for this permit, projects must not cause the loss of greater than 1/2-acre of non-tidal WOUS. The discharge must not cause the loss of more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds the Sacramento District Engineer waives the 300 linear foot limit by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects. The loss of stream bed plus any other losses of jurisdictional wetlands and waters caused by the NWP activity cannot exceed 1/2-acre.

Prior to the issuance or authorization of any permit under § 404 of the CWA, the USACE must consider the effect the permit may have on Historic Properties, as required by Section 106 of the National Historic Preservation Act of 1966. A cultural resources report must be prepared in consultation with the USACE Regulatory Project Manager and/or District Archeologist to document the potential *effects* of a project on Historical Properties, and provide an opportunity for comment by the Advisory Council on Historic Preservation.

For project elements that qualify for Nationwide Permit 27, it will be necessary to comply with the *Final Sacramento District Nationwide Permit Regional Conditions for Nevada and the Lake Tahoe Basin in California* including requirements described in Regional Condition B including B(7)(b) which requires that after a stream restoration project is complete, the stream sinuosity must be appropriate to the geomorphology of the surrounding area and must be equal to, or greater than, pre-project sinuosity.

6.5.2 U.S. Fish and Wildlife Service

The USFWS administers the federal Endangered Species Act (ESA) for terrestrial wildlife species. Section 9 of the ESA prohibits the "take" of any wildlife species listed as endangered and most species listed as threatened. Take, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." (50 Code of Federal Regulations [CFR] 17.3).

The ESA includes exceptions to this general take prohibition that allow an action to be carried out, even though the action may result in the take of listed species, where conservation measures are included for the species. Section 7 of the ESA provides an exception for actions authorized (e.g., under a § 404 permit issued by the USACE), funded, or carried out by a federal agency, and § 10 provides an exception for actions that do not involve a federal agency through the preparation of a habitat conservation plan.

For the project elements, it is likely that the USFWS will need to conduct a consultation required under § 7 of the ESA for the USACE § 404 permit if a federally-listed species is present on the site or is indirectly impacted by the project to such a level that take will occur. Significant habitat modifications (e.g., modifications that significantly impair breeding, feeding or sheltering behavior) may also result in the need for a consultation. If there is no federal action triggering a Section 7 consultation (e.g., no § 404 permit is required) and an incidental take is anticipated, it will be necessary to prepare a project specific habitat conservation plan for USFWS review and approval under Section 10 of the ESA.

6.6 Other Regulations and Services

There are numerous other regulations and programs that could affect the implementation of the project elements. Some of these will be dependent upon the site or even the funding that will be used to implement the final project description. These regulations include:

- Grants – State or federal funding will have regulations associated with the management of grant funds
- Tree permits – Both Placer County and the TRPA have tree removal permit regulations

- Local fire department and CAL FIRE – Defensible space requirements associated with Public Resources Code 4291 could apply to the site.
- Public Utilities - Two public utility districts provide utilities to the North Shore communities. Both districts provide sewer, domestic water and public recreation facilities and services. Both districts will require connection fees and inspections for the connection to water and sewer utilities. These districts include the North Tahoe Public Utility District and the Tahoe City Public Utility District.
- Federal Emergency Management Agency - Letter of Map Revision (LOMR) and/or the Conditional Letter of Map Revision (CLOMR) process
- California Department of Transportation – Encroachment permits may be necessary for access to State Route 89 or any work within the State right-of-way.

7 CLOSING AND NEXT STEPS

In summary, the feasibility study shows that there is potential to reverse human impacts to the Lake Tahoe Basin and shorezone wetlands by restoring historical conditions to the Polaris wetland complex, but in a way which balances the needs of the environment with the needs of the community and treats the two holistically, rather than in conflict. Feasible options for restoring SEZ area and functions to the Polaris wetland complex are presented in terms of six Design Elements. The Design Elements are arranged such that they can be paired and/or phased to form a final project. Each Design Element is a general concept for restoration and this feasibility study acknowledges that there are variations to how Design Elements could be implemented. This feasibility study provides the technical background information to guide decision making on which restoration Design Elements to advance for further consideration, but does not make recommendations for an optimal future configuration of the Study Area. The decision-making process will be done collaboratively among the Project stakeholders, landowners, and the public.

For Design Elements that require relocation of existing facilities, four feasible relocation sites are presented for relocating Pomin Park, and seven feasible relocation sites are presented for relocating Lake Forest Campground. The relocation sites have been identified based on basic, screening-level analysis and more detailed studies are needed to evaluate the suitability of relocations sites. Similar to the restoration component, the feasibility study does not make recommendations on relocation sites and only provides the technical background to help guide decision-making.

This feasibility study is available to the general public, and Advisory Group members will organize workshops once the next phase is funded to gather additional input from the public. Since the restoration project and relocation sites are all proposed on public land, ongoing coordination between the public and Advisory Group member agencies will be the primary means for evaluating alternatives. Next steps will primarily include:

- Define roles for Advisory Group member agencies to shepherd the project components through advanced design stages; there may be different leads for the restoration and relocation components.
- Combine design elements—and make refinements—to form a comprehensive plan for the restoration project; if relocation of existing facilities is required, the master plan will identify the best-suited relocation site (or sites if both Pomin Park

and Lake Forest Campground must be relocated). Public involvement will be key to this process.

- Outline a strategy for navigating the environmental review process based on the potential environmental impacts of the comprehensive restoration plan. Multiple configurations for restoration and relocation will need to be defined to support the alternatives analysis component of the review process.
- Initiate the environmental review and regulatory process; the contents of the Regulatory Setting section of this feasibility study can be used to form a general understanding of the scope of the pertinent requirements and the associated funding needs.

A large portion of the funding for future project phases will be sought through grants. As such, the project schedule will be influenced by grant availability and timing of grant cycles.

Regardless of the future direction of the project, all of the restoration Design Elements would benefit from ongoing hydrologic monitoring and subsurface investigations. Understanding the range of hydrologic variability and depth of buried wetland soils are significant considerations in designing a robust restoration project; however, multi-year monitoring is often precluded by schedule constraints. Proactive planning of a monitoring program and other biological analyses is not only pertinent to the restoration design, but also pre- and post-project monitoring requirements that are used to quantify success criteria and are typical of grant-funded projects. Lastly, reliable metrics to quantify the effectiveness of the project are significant to advancing the scientific understanding of ecological restoration; baseline information helps practitioners and regulatory agencies establish appropriate expectations and helps funding agencies be more efficient in allocating limited resources.

A monitoring program could be implemented in a straightforward manner by building on the existing monitoring infrastructure to target uncertainties identified within the feasibility study. Specifically, little is known about the spring flow contributions to the Study Area and groundwater levels within the athletic field area. Gaging of sediment concentrations leaving the Study Area would also provide a baseline to compare the anticipated natural filtration from implementation of the restoration project. Additional site-specific studies will eventually be required to support the restoration design (for instance, biological surveys, subsurface investigations, and detailed topographic

surveys), however, hydrologic monitoring is emphasized because of the seasonal and inter-annual variability and associated longer timeline for data collection.

The restoration and relocation approaches described herein have attempted to fit within ongoing planning efforts for the north shore of Lake Tahoe rather than pose new constraints to those efforts. To this end, the feasibility study has assimilated the diverse viewpoints of the Advisory Group and the public at an early stage. Future phases of the project will continue with the same collaborative spirit to yield the best possible outcome for Lake Tahoe and the community.

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PLATES

INSTALL BIO-ENGINEERED STRUCTURES TO PROMOTE DIFFUSE FLOW

REMOVE CAMPGROUND INFRASTRUCTURE

STATE ROUTE 28

POLARIS CREEK

LAKE FOREST ROAD

LAKE FOREST CREEK

REMOVE BRIDGE

CONSTRUCT MULTIPLE SPILL POINTS TO RESTORED WETLAND

INSTALL BIO-ENGINEERED STRUCTURES (DEBRIS JAMS AND LOG STRUCTURES) TO PROMOTE DIFFUSE FLOW

RESTORED WETLAND

REMOVE BRIDGE

REMOVE PORTION OF PARKING AREA AND RELOCATE PLAYGROUND

BURTON CREEK

FILL HARBOR TO RE-ESTABLISH LAKE FRINGE AND MEADOW/ MARSH HABITAT

PRESERVE/ENHANCE EXISTING CHANNEL AND BOULDER STEPS

PRESERVE EXISTING TREES FOR SCREENING

INSTALL SHORE PROTECTION TO STABILIZE HARBOR FILL (TO BE INUNDATED AT HIGH LAKE LEVELS)

PRESERVE BEACH

LAKE TAHOE

RELOCATE TRAIL AND PRESERVE BEACH ACCESS

LEGEND:

STUDY AREA

PROJECT FOOTPRINT

EXISTING STREAMS

PROPOSED TRAILS

N

0 75 150 300 450

Feet

CONCEPTUAL PLANS - NOT FOR CONSTRUCTION

Y:\GIS\Projects\218093 Polaris wetland restoration\CONCEPTUAL DESIGNS\218093 FULL RESTORATION.mxd

PREPARED FOR:

Balance Hydrologics, Inc.
P.O. Box 1077
12020 Donner Pass Rd
Truckee, CA 96161
(530) 550-9776
www.balancehydro.com

SUBMITTALS / REVISIONS	BY	DATE
CONCEPTUAL PLANS	PK	11-5-19

DESIGNED BY	DRAWN BY	CHECKED BY	IN CHARGE	DATE
P KULCHAWIK	P KULCHAWIK	D SHAW		11-5-19

FULL RESTORATION WITH ATHLETIC FIELD RELOCATION

POLARIS CREEK RESTORATION AT POMIN PARK

PLACER COUNTY, CALIFORNIA
TAHOE RESOURCE CONSERVATION DISTRICT

PROJECT NUMBER
218093

SCALE
1" = 80'

PLATE
1

INSTALL BIO-ENGINEERED STRUCTURES TO PROMOTE DIFFUSE FLOW

REMOVE CAMPGROUND INFRASTRUCTURE

CONSTRUCT OVERFLOW BOAT TRAILER PARKING

PRESERVE BRIDGE AND CONSTRUCT TRAIL TO CONNECT OVERFLOW PARKING TO BOAT RAMP

MODIFY ATHLETIC FIELD CONFIGURATION

CONSTRUCT MULTIPLE SPILL POINTS TO RESTORED WETLAND

INSTALL BIO-ENGINEERED STRUCTURES (DEBRIS JAMS AND LOG STRUCTURES) TO PROMOTE DIFFUSE FLOW

EXTEND TURF TO SOUTH BY 40'

FILL HARBOR TO RE-ESTABLISH LAKE FRINGE AND MEADOW/ MARSH HABITAT

PRESERVE/ENHANCE EXISTING CHANNEL AND BOULDER STEPS

BOAT-IN CAMPSITES (NON-MOTORIZED VESSELS ONLY)

PRESERVE EXISTING TREES FOR SCREENING

INSTALL SHORE PROTECTION TO STABILIZE HARBOR FILL (TO BE INUNDATED AT HIGH LAKE LEVELS)

PRESERVE BEACH

RELOCATE TRAIL AND PRESERVE BEACH ACCESS

POLARIS CREEK

LAKE FOREST CREEK

BURTON CREEK

STATE ROUTE 28

LAKE FOREST ROAD

RESTORED WETLAND

LAKE TAHOE

LEGEND:

STUDY AREA

PROPOSED TRAILS

EXISTING STREAMS

0 75 150 300 450

Feet

CONCEPTUAL PLANS - NOT FOR CONSTRUCTION

Y:\GIS\Projects\218093 Polaris wetland restoration\CONCEPTUAL DESIGNS\218093 MODIFICATION-RESTORATION.mxd

PREPARED FOR:

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SUBMITTALS / REVISIONS	BY	DATE
CONCEPTUAL PLANS	PK	11-5-19

DESIGNED BY	DRAWN BY	CHECKED BY	IN CHARGE	DATE
P KULCHAWIK	P KULCHAWIK	D SHAW		11-5-19

PARTIAL RESTORATION WITH AMENITIES

POLARIS CREEK RESTORATION AT POMIN PARK

PLACER COUNTY, CALIFORNIA
TAHOE RESOURCE CONSERVATION DISTRICT

PROJECT NUMBER
218093

SCALE
1" = 80'

PLATE
2

APPENDICES

APPENDIX A

Phase 1A Cultural Resources Inventory: Archaeological Literature Review and Native American Consultation

POLARIS-POMIN WETLAND COMPLEX PROJECT

PHASE 1A CULTURAL RESOURCE INVENTORY: ARCHAEOLOGICAL LITERATURE REVIEW AND NATIVE AMERICAN CONSULTATION

Report prepared by

Susan Lindström, Ph.D. (RPA), Consulting Archaeologist

Truckee, California

Report prepared for

Balance Hydrologics, Inc.

Truckee, California

January 2019

TABLE OF CONTENTS

FIGURES

Note that this appendix contains confidential archaeological site information. To prevent the deliberate and/or inadvertent destruction of cultural resources, this information should be used for planning purposes only and should not be distributed to the public. Releasing information about the nature and location of archaeological resources is restricted under Section 304 of the National Historic Preservation Act (16 U.S.C. 470w-3) and Section 9 of the Archaeological Resources Protection Act (16 U.S.C. 470hh; 36 CFR296.18).

SUMMARY

Project Background, Authority and Scope

As part of the Polaris-Pomin Wetland Complex Project, the Tahoe Resource Conservation District proposes to investigate the restoration potential and relocated and/or modified recreational alternatives for the Robert Pomin Park, Lake Forest Campground, and associated parking spaces. These facilities make up an approximate 22-acre wetland complex within the Polaris Creek drainage. The area containing the park, campground and parking lot would be restored and up to three alternative locales (no larger than five acres each in size) would be analyzed for their suitability in terms of park relocation. The Pomin Park component is the focus of the current restoration efforts, with only basic-level screening given to the general area that might contain the alternative relocation sites.

As part of the planning process, baseline environmental studies are required, including a cultural resource investigation. Environmental review policies must be in keeping with guidelines established by the Tahoe Regional Planning Agency (TRPA Code of Ordinances Chapter 67) and state and county antiquities guidelines under the California Environmental Quality Act (CEQA Section 15060-15065; 5024 Public Resources Code). All require that a study be performed to inventory, record and evaluate cultural resources within a proposed project area. Within this regulatory context, cultural resource studies are customarily performed in a series of phases, each one building upon information gained from the prior study. The inventory phase (*Phase 1*) involves prefield research and Native American contact (*Phase 1A*), field reconnaissance/resource discovery (*Phase 1B*), and documentation of any cultural resources located within the project area (*Phase 1C*). If cultural properties are present and subject to project-related impacts, their significance is evaluated according to eligibility criteria established in the California Register of Historical Resources (*Phase 2*). If project redesign to avoid impacts to eligible resources is unfeasible, then mitigation measures are implemented (*Phase 3*). Mitigation (or data recovery) typically involves supplemental archival research, field excavation, photo documentation, mapping, archaeological monitoring, interpretation, etc.

The objectives of this study are designed to satisfy cultural guidelines pertaining only to *Phase 1A.* Tasks included:

- review historical and archaeological background research of the project area;
- conduct records search of the master archaeological inventory at the North Central Information Center (NCIC) at California State University, Sacramento;
- request Sacred Lands File searches with the Native American Heritage Commission (NAHC) and initiate follow-up contacts with local tribal organizations identified by the Commission;
- present findings in a *Phase 1A* technical report.

The archaeological and historical records review by the NCIC, Sacred Lands Files search by the NAHC, and follow-up Native American consultation targeted the 22-acre restoration area and 1/8th -

mile search radius where project boundaries are currently set. The physical and cultural setting concerns a larger one or two-mile radius surrounding the Polaris-Pomin restoration site, intended to encompass any one of the future project relocation alternatives. This larger search radius roughly extends to Tahoe City on the southwest and the Dollar Point/Dollar Hill area on the northeast and focuses on historical ecology and disturbance in the watersheds of Polaris, Burton and Dollar creeks.

Findings

To perform the cultural resource study, Balance Hydrologics, Inc. contracted with Susan Lindström, Ph.D., Consulting Archaeologist.

An in-house records search conducted by the NCIC disclosed that 10 prior archaeological studies have been conducted within the Polaris-Pomin Wetland Complex Project area and five additional studies have occurred within a 1/8-mile search radius. While these prior studies have covered much of the project area, most were limited to records review (i.e., *Phase 1A*). The project has never been subjected to a complete and systematic archaeological field survey (i.e., *Phase 1B*. Five cultural resources have been recorded within the 1/8-mile search radius and two cultural resources have been inventoried within the project area: one prehistoric lithic scatter (P-31-414/CA-PLA-288) and the historic (1963) Lake Forest Boat Ramp (P-31-5660). The prehistoric lithic scatter (P-31-414/CA-PLA-288) was identified in the far southwestern corner of the project area east of the mouth of Burton Creek. Its content and integrity remain unconfirmed. Since the site was last observed over 30 years ago, physical remains now require field confirmation as part of the next phase of the project. The second archaeological site within the project area is the historic (1963) Lake Forest Boat Ramp (P-31-5660), located along Lake Tahoe's shoreline near the mouth of Polaris Creek. The resource was inventoried and evaluated in 2009 and found ineligible for listing in both the National Register of Historic Places and the California Register of Historical Resources. Therefore, the Lake Forest Boat Ramp need not be considered further in the current environmental review process.

Native American outreach was accomplished according to CEQA guidelines and mandates under California Assembly Bill 52 (pursuant to PRC 21080.3.1). No specific project concerns have been identified.

Conclusions and Recommendations

With the completion and submittal of this report, state, county and regional requirements for a *Phase 1A* cultural resource inventory have been accomplished – the first step in the cultural resources protocol. Recommendations for further archaeological work are as follows.

- Pending selection of the alternative relocation areas, an updated *Phase 1A* records search with the North Central Information Center and Native American Heritage Commission should be completed for each alternative area.
- *Phase 1B* field surveys of the 22-acre restoration site and each alternative relocation area should follow.
- All cultural resources encountered within the project area should be field documented, including prehistoric site P-31-414/CA-PLA-288 (*Phase 1C*).

- If cultural properties are present and subject to project-related impacts, their significance should be evaluated according to eligibility criteria established in the California Register of Historical Resources (*Phase 2*).
- If project redesign to avoid impacts to eligible resources is unfeasible, then mitigation measures should be implemented (*Phase 3*).
- If additional cultural resources are discovered during project constuction, project activities should cease near the find and the project sponsor should consult a qualified archaeologist for recommended procedures. A registered professional archaeologist (RPA) should be on-call during project ground-disturbance activities.
- In the unlikely event that human remains are encountered, all activities should stop, and the County Coroner's Office should be contacted.

PROJECT BACKGROUND AUTHORITY AND SCOPE

PROJECT LOCATION AND DESCRIPTION

The Tahoe Resource Conservation District (TRCD) proposes to investigate the restoration potential and relocated and/or modified recreational alternatives of the Robert Pomin Park, Lake Forest Campground, and associated parking spaces. These facilities make up an approximate 22-acre wetland complex within the Polaris Creek drainage. The area containing the park, campground and parking lot would be restored and up to three alternative relocation sites (no larger than five acres each in size) would be analyzed for their suitability in terms of park relocation. The project would be administered by the TRCD, in coordination with Placer County, the Tahoe City Public Utility District (TCPUD), and the California Department of Parks and Recreation (DPR). The Pomin Park component is the focus of the current restoration efforts (and this report), with only basic-level screening given to the general area that might contain the alternative relocation sites.

The 22-acre restoration site is bounded by Lake Tahoe and the Lake Forest Boat Ramp on the south, State Route 28 and Burton Creek State Park on the north, Lake Forest Road and the U.S. Coast Guard facility on the east and Burton Creek drainage on the west, with Robert Pomin Park, Lake Forest Campground and associated parking areas at its center. The project falls within Township 16 North, Range 17 East, sections 31 and 32 and Township 15 North, Range 17 East, Section 5, M.D.M., USGS Kings Beach 7.5 Quad (figures 1-2).

REGULATORY BACKGROUND

As part of the planning process, baseline environmental studies are required, including a cultural resource investigation. Environmental review policies must be in keeping with guidelines established by the Tahoe Regional Planning Agency (TRPA Chapter 67) and state and county antiquities guidelines under the California Environmental Quality Act (CEQA Section 15060-15065; 5024 Public Resources Code). All require that a study be performed to inventory, record and evaluate cultural resources within a proposed project area.

State Guidelines

The CEQA process is outlined in CEQA Guidelines (Section 15060-15065). For the purposes of CEQA, significant "historical resources" and "unique archaeological resources" are defined and quoted as follows (CEQA Guidelines Section 15064.5[a]).

> (1) A resource listed in or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4850 et seq.).
>
> (2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

The significance of a cultural resource on a state level is typically evaluated in terms of criteria established in the California Register of Historical Resources, which are patterned after eligibility criteria set forth in the National Register of Historic Places. The National Register is an elite register of districts, sites, buildings, structures, and objects of significance in American history, architecture, archaeology, engineering, and culture that generally fall under the jurisdiction of the federal government. Properties that may not be individually eligible for listing on the National Register can meet the criteria of eligibility if they are integral parts or "contributing elements" of an eligible site or district. Properties can be significant on the national, state or local level. Criteria of eligibility under the California Register focus on a cultural property's associations with significant **events** (Criterion 1) and **personalities** (Criterion 2) in state and local history and cultural heritage, its **distinctive** technical, architectural or artistic **characteristics** (Criterion 3), and/or a property's **information potential** (Criterion 4). A property must not only be shown to be eligible under one or more of these criteria, but it must also have **integrity** of location, design, setting, materials, workmanship, feeling, and/or association. Resources are generally older than 50 years and are evaluated within a specific and important time frame or **period of significance** during which the property was occupied or used. The California Register includes properties that are listed in or have been formally determined eligible for listing in the National Register, or ones qualifying as a State/Local Historical Landmark, an eligible Point of Historical Interest, as well as resources designated under a local ordinance as contributing to the significance of a local historic district.

Regional Guidelines

The TRPA has also adopted procedures for the identification, recognition, protection, and preservation of the region's significant cultural, historical, archaeological, and paleontological resources (Chapter 67 of the Code of Ordinances). Sections 67.3.2, 67.4 and 67.5 require a site survey by a qualified archaeologist, an inventory of any extant cultural resources, and consultation with the appropriate Native American group(s). Provisions for a report documenting compliance with the TRPA Code are contained in Section 67.7. Cultural resource significance is patterned after federal and state criteria (as noted above).

PROJECT SCOPE

Within this regulatory context, cultural resource studies are customarily performed in a series of phases, each one building upon information gained from the prior study.

Phase 1 Inventory. First, archival research and an archaeological field reconnaissance are performed to inventory and record known cultural resources and identify potential project constraints. *Phase 1A* of the inventory involves prefield research, Native American consultation and the required records search at the appropriate archaeological clearing house. A *Phase 1B* field survey to identify surface sites, features, buildings, and/or artifacts follows. If cultural resources are discovered, *Phase 1C* cultural resource recording is initiated.

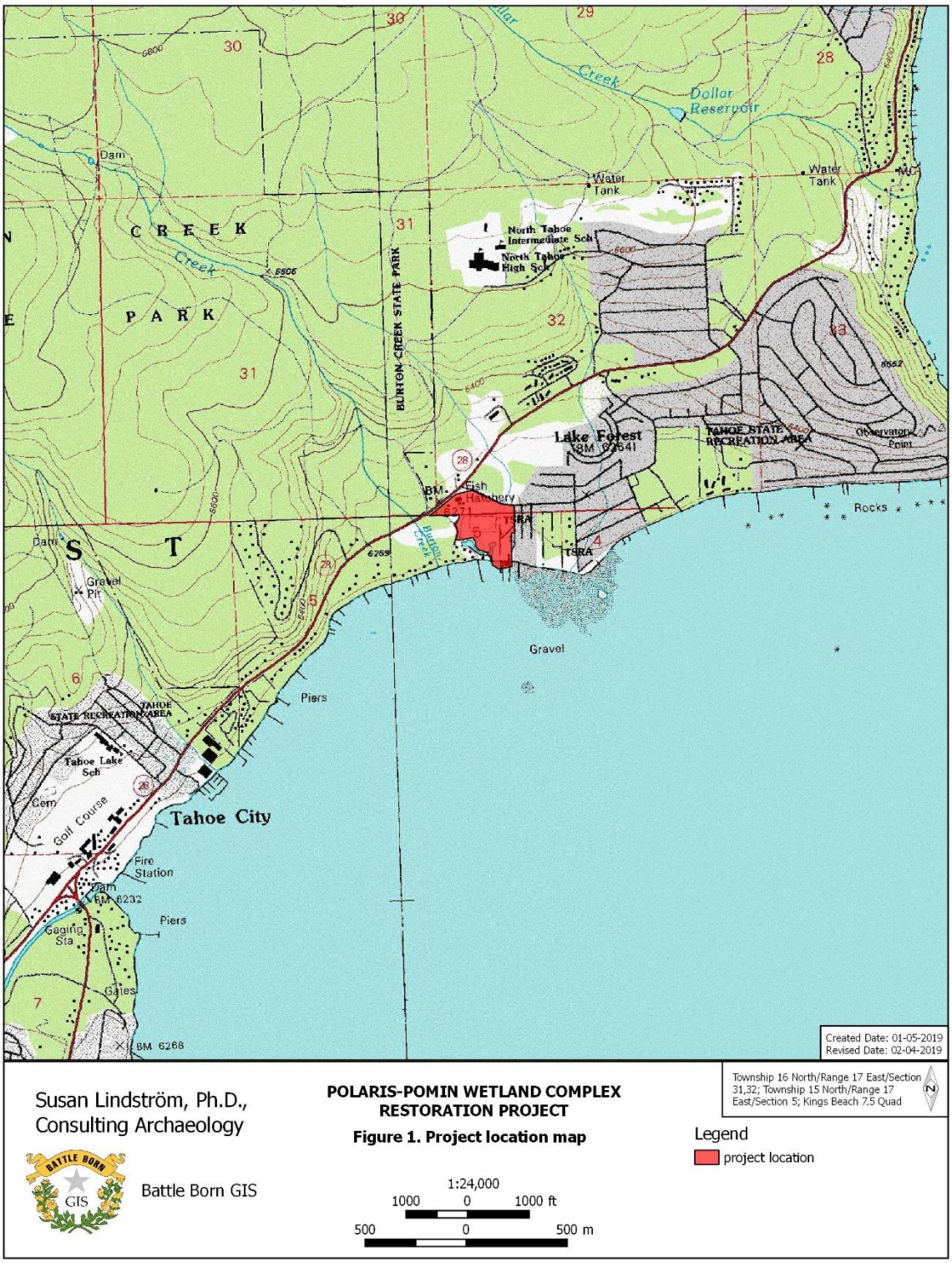
Phase 2 Evaluation. Once cultural properties are recorded and if they may be subject to project-related impacts, their significance is evaluated according to criteria established in the California Register of Historical Resources. For significant resources, a determination of project impacts is assessed and detailed measures to mitigate impacts are proposed. If project redesign to avoid impacts is unfeasible, then mitigation measures are recommended to recover the significant information contained within these cultural properties prior to project ground disturbance activities.

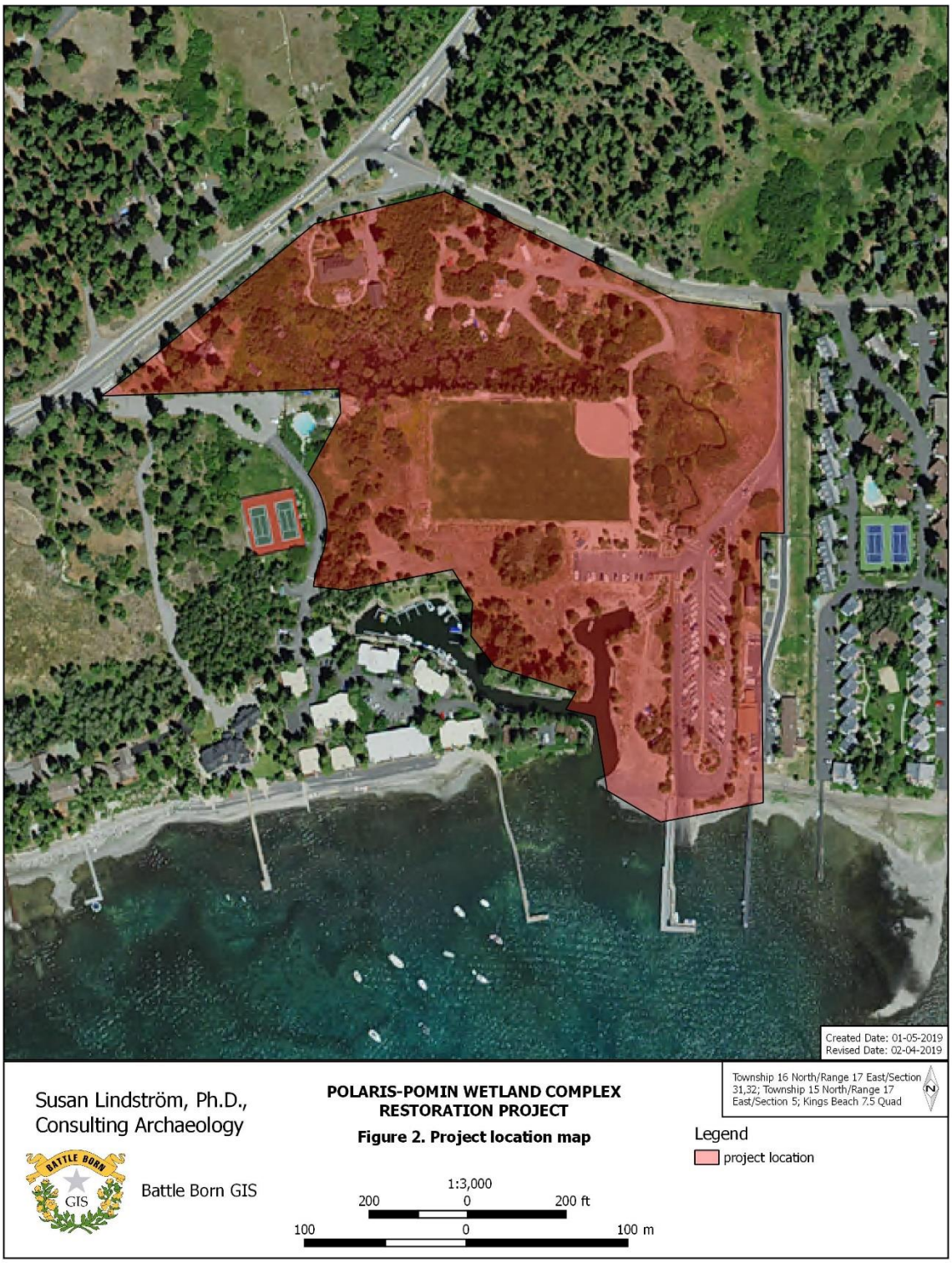
Phase 3 Impact Mitigation and Data Recovery. A final phase may involve the implementation of mitigation measures recommended during the prior evaluation phase. Mitigation, or data recovery, typically involves additional archival research, field excavation, photo documentation, mapping, archaeological monitoring, etc.

The objectives of this study are designed to satisfy cultural guidelines pertaining only to *Phase 1A.* The project scope of work does not consider architectural resources or buildings and objects of the built environment. Rather, tasks include:

- review historical and archaeological background research of the project area;
- conduct records search by the California Historical Resources Information System, North Central Information Center (NCIC) at California State University, Sacramento;
- request Sacred Lands File search by the Native American Heritage Commission (NAHC) and initiate follow-up contacts with local tribal organizations identified by the Commission;
- present findings in a *Phase 1A* technical report.

This archaeological and historical records review by the NCIC and search of the Sacred Lands Files by the NAHC, with follow-up Native American consultation, targeted the 22-acre restoration area where project boundaries are currently set. The physical and cultural setting concerns a larger one or two-mile radius surrounding the Polaris-Pomin restoration site, intended to encompass any one of the future project relocation alternatives. This radius roughly extends to Tahoe City on the southwest and the Dollar Point/Dollar Hill area on the northeast and focuses on historical ecology and disturbance in the watersheds of Polaris, Burton and Dollar creeks.


Dollar Reservoir
Water Tank
North Tahoe Intermediate Sch
North Tahoe High Sch
BURTON CREEK STATE PARK
Lake Forest
TAHOE STATE RECREATION AREA
Observation Point
Rocks
Gravel Pit
Gravel
Piers
Tahoe Lake Sch
Golf Course
Tahoe City
Fire Station
Gaging Sta
Gates
BM 6268
Created Date: 01-05-2019
Revised Date: 02-04-2019
Susan Lindström, Ph.D.,
Consulting Archaeology
Battle Born GIS
POLARIS-POMIN WETLAND COMPLEX RESTORATION PROJECT
Figure 1. Project location map
Township 16 North/Range 17 East/Section 31,32; Township 15 North/Range 17 East/Section 5; Kings Beach 7.5 Quad
Legend
project location
1:24,000
1000 0 1000 ft
500 0 500 m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Revised Date: 02-04-2019
Susan Lindström, Ph.D.,
Consulting Archaeology
Battle Born GIS
POLARIS-POMIN WETLAND COMPLEX
RESTORATION PROJECT
Figure 2. Project location map
Township 16 North/Range 17 East/Section 31,32; Township 15 North/Range 17 East/Section 5; Kings Beach 7.5 Quad
Legend
project location
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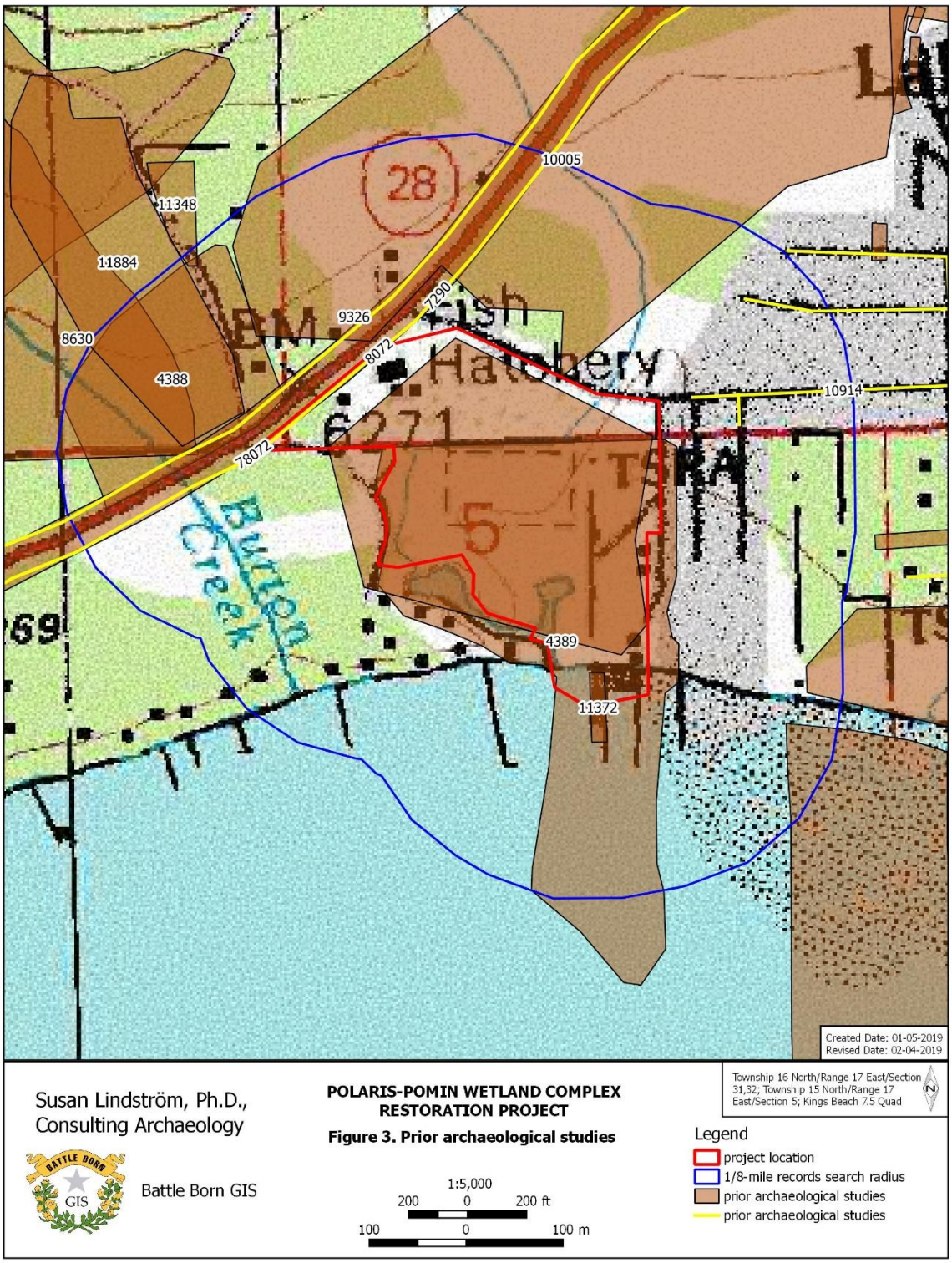
10005
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9326
7290
8630
8072
4388
10914
78072
4389
11372
28
5
Hatchery
Fish
Creek
Created Date: 01-05-2019
Revised Date: 02-04-2019
Susan Lindström, Ph.D.,
Consulting Archaeology
Battle Born GIS
POLARIS-POMIN WETLAND COMPLEX
RESTORATION PROJECT
Figure 3. Prior archaeological studies
1:5,000
200 0 200 ft
100 0 100 m
Township 16 North/Range 17 East/Section 31,32; Township 15 North/Range 17 East/Section 5; Kings Beach 7.5 Quad
Legend
project location
1/8-mile records search radius
prior archaeological studies
prior archaeological studies

SETTING

The cultural setting of this report is primarily adapted from Lindström (2013), Lindström and Waechter (1996), and Waechter and Lindström (2014). Text is also drawn directly from a historic context of Burton Creek State Park (Lindström 2008) prepared for the Department of Parks and Recreation and a narrative prepared in 2004 for Chambers Group, Inc. (2007) for the Lake Forest Area B Erosion Control Project (Lindström 2004). Prior archaeological and ethnographic studies indicate that the Washoe Indians are the applicable tribal authorities for lands encompassing the study area. Numerous prehistoric sites dating from the last 9,000 years have been inventoried in the project vicinity, and some are marked by Washoe place names. Historic topics germane to the project area center around the theme of community growth and entail: (1) transportation; (2) logging; (3) fisheries; and (4) tourism, residential and commercial development, and subsidiary water and waste management.

PHYSICAL ENVIRONMENT

The Polaris-Pomin Wetland Complex Project is situated along the northwest shore of Lake Tahoe along the eastern edge of the Burton Creek Watershed. The Burton Creek drainage is the 44th largest watershed out of 63 within the Tahoe Basin. Burton Creek flows into Star Harbor, which also receives drainage from Polaris Creek before it flows into Lake Tahoe. (Polaris Creek appears as an unnamed drainage on USGS topographic maps.) Inflow from the Dollar Creek watershed into Lake Tahoe is farther to the northeast of Polaris Creek and north of Dollar Point. All these streams can be ephemeral with no water inflow during the late summer. Creek flows and corresponding aquatic populations have changed according to natural seasonal flows, as well as human disturbances due to historical creek diversions and the development of waterworks. For example, the quality and extent of wetlands and meadowlands within the Burton Creek drainage have been diminished by the historic diversion of surface flows of Burton Creek to Tahoe City (Lindström 2008).

The littoral zone of Lake Tahoe adjacent to Lake Forest and within the Polaris-Pomin Wetland Complex is a relatively flat, gradually sloping plain from the shoreline south to about two miles offshore where the water depth is around 60 feet with a slope of 0.6%. From that point, the lake bottom drops off steeply reaching a depth of 600 feet with a slope of 12.7% (Loeb 2013).

The geology of the watershed and general area have been influenced greatly by Pleistocene volcanic activity that occurred between 2.3 and l.2 million years ago (Birkeland 1963). Eruptions extruded in the northern part of the basin and have been correlated with the Lousetown Formation of medium-gray, fine-grained latites and basalts. The proximity of basalt sources suitable as prehistoric toolstone material influenced aboriginal land use of the north Tahoe uplands, especially in the vicinity of Mt. Pluto and Mt. Watson (Bloomer et al. 1997; Lindström and Waechter 1996).

The project area falls within Storer and Usinger's (l97l) Lodgepole Pine-Red Fir Belt. Jeffrey pine (*Pinus jeffreyi*) dominates native forest stand; white fir (*Abies concolor*) and incense cedar (*Libocedrus decurrens*) are also present. Understory species include bitterbrush (*Pursia tridentata*), manzanita (*Arctostaphylos* spp.), mountain whitethorn (*Ceanothus cordulatus*), and assorted riparian plants and wet-meadow grasses and forbs.

It is doubtful that modern plant and animal communities closely resemble their pristine composition due to past disturbance. In earlier times the area is thought to have supported a luxuriant growth of native bunch grasses that allowed an abundant large game population and provided a nutritious source of seeds for use by prehistoric peoples. Oral histories from Native American Elders and with descendants of pioneer families document a variety of valued medicinal and edible plants within the Truckee River corridor. Forests within the watershed were intensively harvested from the later 1860s into the 1960s and native fisheries were depleted by the 1920s. More recently, the native ecology of the project area has been significantly changed. Portions of the Polaris/Burton Creek wetland have been altered and infilled and creek channels have been diverted to accommodate the Lake Forest Public Access and Boat Ramp and paved parking, a U.S. Coast Guard facility, the Lake Forest Campground, the Tahoe City Fish Hatchery, and the Robert Pomin Park and ball field.

PREHISTORY

Current understanding of northern Sierra Nevada and western Great Basin prehistory is framed within a chronological sequence spanning nearly 12,000 years that is drawn from paleoclimatic and archaeological studies throughout the western Great Basin, eastern Sierra front and the Tahoe-Truckee area (especially see Elston 1971, 1982, 1986; Elston et al. 1977, 1994, 1995; Grayson 1993). This work has been summarized by Waechter and Lindström (2014) and is excerpted below. In broadest terms, the archaeological signature of the Tahoe Sierra marks a trend from hunting-based societies in earlier times to more dispersed populations that were increasingly reliant upon diverse resources by historic contact. The change in lifeways may be attributed partially to factors involving paleoclimatic fluctuations, a shifting subsistence base, and variable demographics.

Pre-Archaic remains suggest occupation by at least 9,000 years ago in the Tahoe Sierra during the Late Pleistocene/Early Holocene (~12,500-8,000 years ago) as glaciers retreated, pluvial lakes shrank, and climates warmed (Elston's et al. 1977 "Tahoe Reach Phase"). Technologically, this period is marked by large-stemmed "Parman" and "Great Basin Stemmed" projectile point styles. Early populations were highly mobile in the pursuit of large game animals.

Pre-Archaic to Early Archaic occupation dates from about 7,000-5,500 years ago during the Middle Holocene (~8,000 to 5,500 years ago). Increased warming and drying caused diminished creek flows and lake levels in Tahoe and other regional lakes to drop, allowing trees to grow in areas that were once inundated (Lindström et al. 2000). This period is characterized by a decrease in the number of archaeological sites that may reflect declining resources and populations in the Tahoe Sierra. Marker artifacts present during this time extend into later periods and so are difficult to distinguish (Rosenthal and McGuire 2004).

The "Early" Late Holocene dating between 5,500 and 2,000 years ago (Elston's et al. 1977 "Early Martis Phase") witnessed the end of the Mid-Holocene droughts, with a consequent expansion of forests and woodlands (Wigand 2005) and a rise in Lake Tahoe and other regional lakes and streams that drowned ancient forests along the shoreline (Lindström et al. 2000). This was the most intensive period of prehistoric occupation in the region. The archaeology indicates an increase in the numbers of sites and diversity of habitats where Middle Archaic populations are found. Evidence of

cultural complexity and elaboration (beginning around 4,000 years ago) is reflected in larger and more permanent house types, craft specialization, stylistic variety in projectile points ("Elko-Martis Series"), and basalt bifacing technology (McGuire and Bloomer 1997; McGuire et al. 2006).

A warming and drying trend with a decline in winter precipitation during the "Middle" Late Holocene between 2000 and 1000 years ago (Elston's et al. "Late Martis" / "Early Kings Beach" phases) coincided with profound cultural changes. The bow and arrow (represented by smaller projectile points) largely replaced the atlatl dart and spear and hunters shifted to finer-grained tool stone like chert and obsidian more commonly than basalt. Land use diversified, and people expanded into previously under-used habitats. Populations intensified their consumption of less favored resources (e.g., roots, seeds, small mammals) that required more time and effort to procure and process.

Around 1,000 years ago during the Late Holocene (Elston's et al 1977 "Kings Beach" Phase), much of the west was affected by frequent and dramatic fluctuations in temperature and precipitation marked by prolonged and severe droughts (Stine 1994). Late Archaic human populations continued to rise and stressed by periodic but extreme warm and dry conditions (known as the "Medieval Climatic Anomaly"), shifted away from large game hunting to the further pursuit of foods previously ignored (e.g., plants, fish and small game). This period is reflected archaeologically in more intensive use of all parts of the Tahoe Sierra landscape, with more dispersed and ephemeral settlement patterns allowing for year-round residence in the Tahoe highlands at sometimes and prohibiting even seasonal occupation at other times. These changes and the introduction of small side-notched arrow points ("Desert Side-Notched" Series) towards the end of the prehistoric period, may reflect the arrival of incoming Numic-speaking populations (e.g., Paiute groups) into an area that had been occupied for thousands of years by Hokan-speakers (Jacobsen 1966), the protohistoric ancestors of the Washoe Indians (Elston's et al 1977 "Late Kings Beach Phase"). Prior to this time, their relatively rich environment afforded the Washoe a degree of isolation and independence from neighboring peoples and may account for their long tenure in their known area of historic occupation (d'Azevedo 1984; 1986:466, 471; Lindström 1992, 1996; Price 1962). It is estimated that the prehistoric Washoe had one of the highest population densities in the western Great Basin.

The Washoe regard all "prehistoric" remains and archaeological sites within the Truckee-Tahoe basins as associated with their own past. In support of this contention, they point to the traditions of adjoining groups (e.g., Northern Paiute and neighboring California Indians) that include stories about migrations and movement, whereas theirs do not (Rucks 1996:6). However, use by neighboring Maidu, Miwok and Northern Paiute groups is not ruled out (Bloomer and Lindström 2006:10).

WASHOE HISTORY

The study area lies entirely within the nuclear territory of the Washoe Indians (Downs l966) or *Wa she shu* (Nevers l976). Lake Tahoe was both the spiritual and physical center of the Washoe world. The Washoe lived along its shores, referring to it as *Da ow a ga*, which means "edge of lake." The Washoe word, *Da ow*, mispronounced by whites as "Tahoe," gave rise to the lake's modern name. Several Washoe encampments have been reported to ethnographers d'Azevedo (1956, 1986) and Freed (1966) along Tahoe's northwest shore:

- *wO'thanamIn* was the name given for Burton Creek by Freed's Washoe consultant who noted whitefish runs "earlier than on Trout Creek" and that Washoe collected grasshoppers from the nearby meadows and "big green worms that live on trees."
- *DiphEkhwO'tha* (white paint + stream/creek/river) was the name given to an adjacent drainage, "formerly" a creek that was apparently no longer extant in the 1950s when Freed was collecting this information. Here, the Washoe "obtained fish, porcupine, berries, *cu'wEthUkh* [western service berry], and white clay with which they decorated themselves."

In her ethnographic descriptions of the Lake Forest vicinity, Rucks (2004) states that both places noted above were important campsites. Yet, none of the other sources listing place names and/or habitation areas list either place or discuss the location (Dangberg 1968; d'Azevedo 1956; Nevers 1976); and neither Manuel Bender's or Richard Barrington's resource information for the Washoe Lands Case rank Burton Creek in their listing of Washoe fisheries (Wright 90-37 in Rucks 2004).

The Washoe once embodied a blend of Great Basin and California in their geographical position and cultural attributes. While they were an informal and flexible political collectivity, Washoe ethnography hints at a level of technological specialization and social complexity for Washoe groups, non-characteristic of their surrounding neighbors in the Great Basin. Semi-sedentism and higher population densities, concepts of private property, and communal labor and ownership are reported and may have developed in conjunction with their residential and subsistence resource stability (Lindström 1992, 1996).

The ethnographic record suggests that during the mild season, small groups traveled through high mountain valleys collecting edible and medicinal roots, seeds and marsh plants, fishing, hunting large game (mountain sheep, deer), and trapping smaller mammals. Suitable toolstone (such as basalt) was quarried at various locales surrounding Tahoe's north shore. The Washoe also have a tradition of making long treks across the sierran passes to hunt, trade and gather acorns. Archaeological evidence of these ancient subsistence activities is found along the mountain flanks as temporary small hunting camps containing flakes of stone and broken tools. In the high valleys permanent base camps are represented by stone flakes, tools, grinding implements, and house depressions.

Historic declines in Washoe population and traditional resource use were caused by disruptions imposed by incoming Euroamerican groups. By the l850s Euroamericans had permanently occupied Washoe territory and changed traditional lifeways. As mining, lumbering, grazing, commercial fishing, tourism, and the growth of settlements disrupted traditional Indian relationships to the land, Washoes were forced into dependency upon Euroamerican settlers (Lindström et al. 2000, 2007). Into the early 20th century, Washoes survived by establishing patronage relationships on ranches and resorts and trading goods and services to the dominant Euroamerican population (selling baskets, catching fish and game, and working as domestic laborers, wood cutters, ice harvesters, caretakers, game guides, etc.). In exchange Washoes arranged for camping privileges on traditional lands with access to what resources remained. Beginning in 1917, however, the Washoe Tribe began acquiring back a small part of their traditional lands (Nevers 1976:90-91). They remain as a recognized tribe by the U.S. government and have maintained an established land base. Tribal members are governed by a council that consists of members of the Carson, Dresslerville, Woodfords, and Reno-Sparks Indian colonies, as well as members from non-reservation areas. Into the 21st century, contemporary Washoe have

developed a Comprehensive Land Use Plan (Washoe Tribal Council 1994) that includes goals of reestablishing a presence within the Tahoe Sierra and re-vitalizing Washoe heritage and cultural knowledge, including the harvest and care of traditional plant resources and the protection of traditional properties within the cultural landscape (Rucks 1996:3).

TRANSPORTATION

A history of Lake Tahoe is chronicled by the movement of people, goods, and services into and through the basin, and this history can be read graphically on the maps depicting these routes of transport. Improvements in transportation opened the door for the development of the Tahoe Basin in the 19th century, just as it paved the way for its explosive expansion throughout the 20th century. Subsequent technological developments and road improvements frequently overlay earlier routes. Earliest lake travelers came by horseback or on foot. Growth was further escalated with the entrance of automobiles into the Tahoe Basin around 1910. Not until 1927 did paved highways circle the lakeshore. During the 1930s a statewide network of engineered and major routes was established through the montane regions.

State Route (SR) 28 borders the Polaris-Pomin Project area on the north. SR 28 incorporates portions of the old 1852-1855 Placer County Emigrant Road, or Scott's Route (figures 4 and 5). As the original "Trail to Carson," it branched off present-day SR 89 in Tahoe City and followed the current SR 28 alignment to Lake Forest, then cut northeast to bypass Observatory Point (Dollar Point) and joined SR 28 in the vicinity of Carnelian Bay. DeGroot's 1863 Map of Nevada Territory references this route as the "Old Immigrant Road." Although the depiction on this map is schematic, it shows another major east-west travel route that did not follow the Truckee River all the way from Truckee to Tahoe City. Rather, it cut over from Truckee through Martis Valley and followed SR 267 over Brockway Summit and then down to Tahoe's north shore to the current route of SR 28, bypassing the section of SR 28 that bounds the project on the north. The SR 89 alignment along the Truckee River between Truckee and Tahoe City was improved in 1861 as the Truckee Tahoe Turnpike. By 1865 General Land Office survey plats show a road along the Truckee River going north and south of Squaw Valley where it joined Scott's Route (or the Placer County Emigrant Road), the primary east-west connector road that accessed the sierran west slope. On the 1868-1867 "Map of the Placerville Route", both the Truckee River Route and the route through Martis Valley and over Brockway Summit are clearly shown. Both routes are similarly depicted on the 1874 "Topographical Map of Lake Tahoe and Surrounding Country" (Figure 4).

In 1874 the old Scott's Route was reconstructed as a new wagon road connecting Brockway and Tahoe City and it was upgraded to a "first-class turn-pike" in 1883 (Edwards 1883:94). By 1889 SR 28 was an established roadway interconnecting north shore communities; grading and surfacing was completed on the road in 1939.

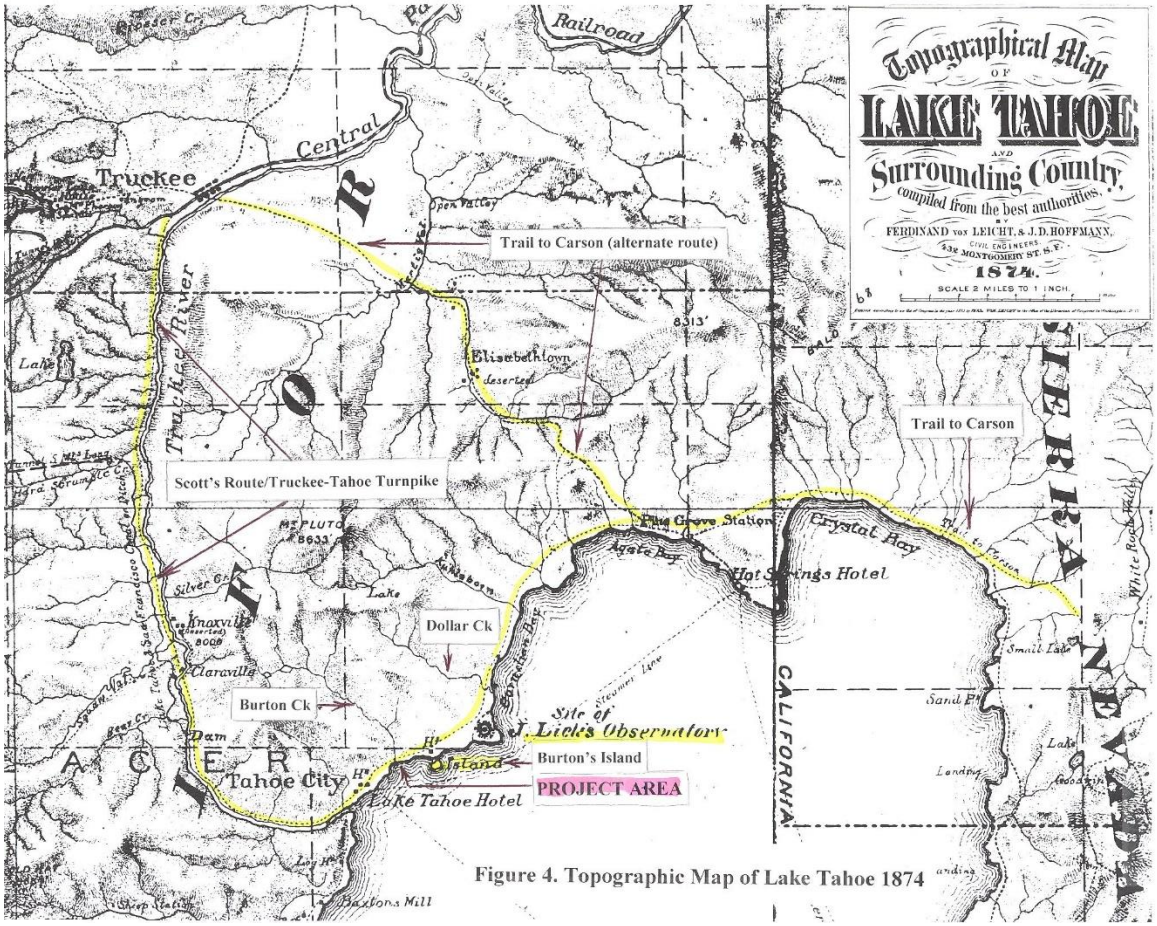
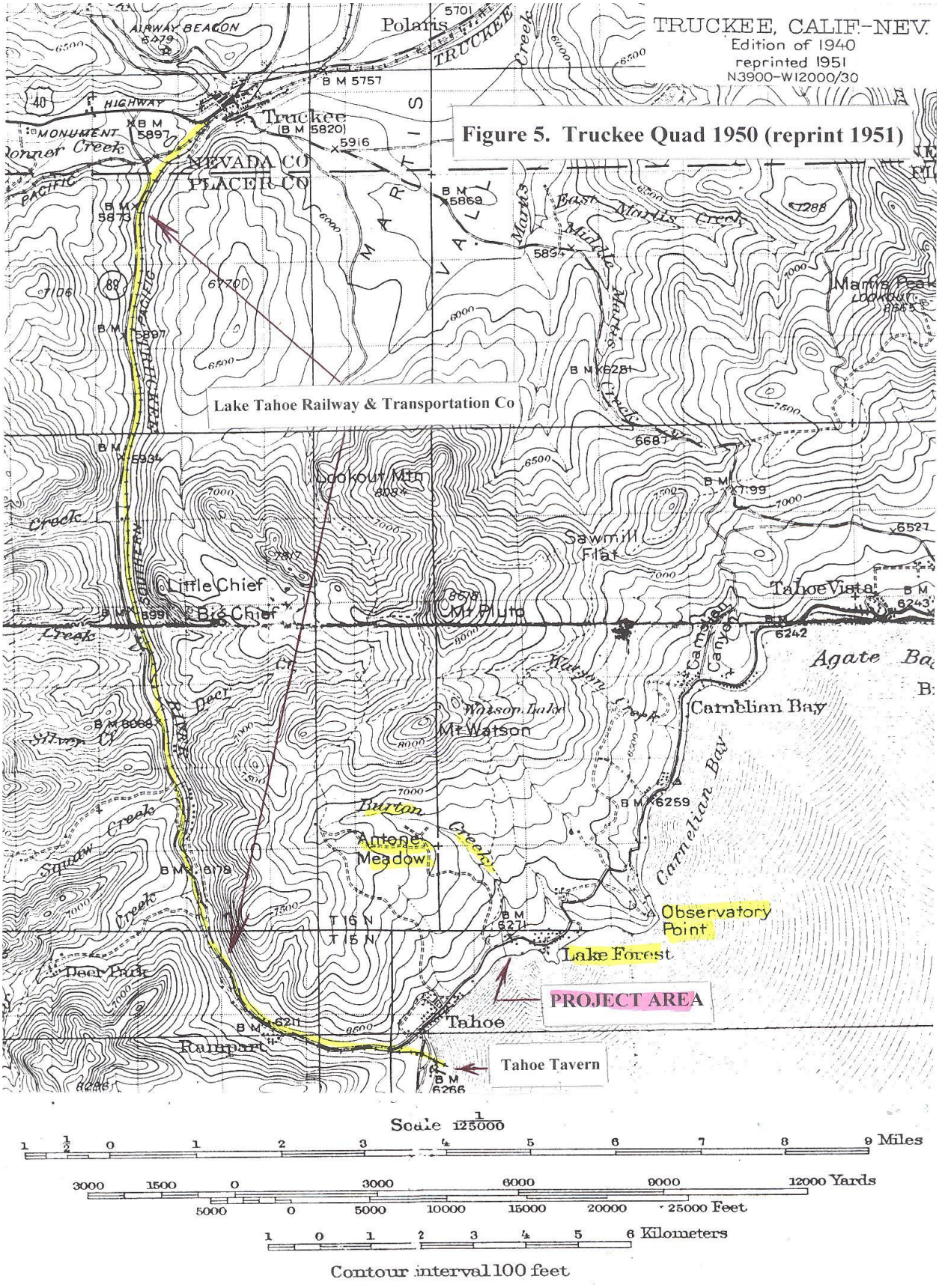


Figure 4. Topographic Map of Lake Tahoe 1874

LOGGING

The history of lumbering in and around the Tahoe Basin took place within the larger history of the Comstock Lode. Lumbering on the California side of Tahoe's north shore was coincident with building the first transcontinental railroad and new wood markets created along its route. In this era, the logistics of timber extraction and transport were mainly accomplished by large lumber companies, whose timber holdings locked up immense blocks of land. Wood contractors, employed by these large firms, carried out much of the harvest. By the turn of the 19th -20th century, lands in the Tahoe Basin were largely stripped of pine, but fir and other species remained. Fir, considered unsuitable for railroad ties and mine timbers, had been largely ignored during the earlier harvesting. Stands were re-entered to harvest fir for use as pulpwood for paper mills. Early 20th century logging operations were conducted on a much smaller scale and carried out on a more limited land base than during the prior Comstock Era. Growing communities in the region created a demand that was supported by localized sawmills and shingle mills, cutting pine and cedar, respectively. By the 1950s, the offspring from pines cut in the 1800s were now mature enough for harvest. Stands were again re-entered and more limited lumber harvest continued through the 1970s. By the 1980s, the forests around Lake Tahoe were of more value as recreational rather than timber resources, and so the large-scale logging that occurred elsewhere in the northern Sierra was curtailed in the Lake Tahoe Basin. More recently, timber interests have been channeled into species thinning and forest health.


TRUCKEE, CALIF.-NEV.
Edition of 1940
reprinted 1951
N3900-W12000/30
Figure 5. Truckee Quad 1950 (reprint 1951)
Lake Tahoe Railway & Transportation Co
PROJECT AREA
Tahoe Tavern
Observatory Point
Lake Forest
Tahoe
Rampart
Truckee
Polaris
Sawmill Flat
Tahoe Vista
Carnelian Bay
Mt Watson
Mt Pluto
Lookout Mtn
Little Chief
Big Chief
Antone Meadow
Deer Park
Squaw Creek
Burton Creek
Watson Lake
Scale 1/125000
1 0 1 2 3 4 5 6 7 8 9 Miles
3000 1500 0 3000 6000 9000 12000 Yards
5000 0 5000 10000 15000 20000 25000 Feet
1 0 1 2 3 4 5 6 Kilometers
Contour interval 100 feet

Lumbering Operations: 1860s-1930s

Several leading lumber companies established logging operations from the 1860s to the 1930s on lands surrounding the project area (Knowles 1942; Lindström and Waechter 1996). D.L. Bliss and H.M. Yerington's Carson and Tahoe Lumber and Fluming Company began acquiring timber tracks around Carnelian Bay and Dollar Point, and in the headwaters of Burton, Polaris and Dollar creeks at least as early as 1875, with Placer County tax assessments being levied on their timber tracks up until 1887. Formed in 1873 and with headquarters at Glenbrook, the company emerged as the chief operator, with holdings in the east-central, southern, southwestern, and northern portions of the Tahoe Basin. Until 1897 a far-reaching network of rafting operations fed the mills at Glenbrook, from which wood was transported via switch-back railroad to Spooner Summit and then flumed down to wood yards on the Virginia and Truckee Railroad near Carson City.

Smaller-scale logging contractors typically supplied stipulated amounts of saw logs or cordwood to larger companies. In the 1880s Captain A. W. Pray, Rube Saxton, and J. Lubeck logged on Dollar Point, probably as part of Carson, Tahoe Lumber and Fluming Company operations. Pray owned Section 32 (Township 16 North, Range 17 East) adjoining the Polaris-Pomin Project area on the north. In 1873 the Company had purchased Pray's mill (the first one established at Glenbrook) and it is possible that these initial business dealings continued into the 1880s as both operators acquired new timber lands around Carnelian Bay and Dollar Point. The fact that both Pray and the Carson Tahoe Lumber and Fluming Company logged the same 337 acres in 1884 (Scott 1957:48, 353), indicates that harvesting was done in collaboration.

R.H. Watson, son of one of Tahoe City's earliest pioneers, Robert Montgomery Watson, lived and operated a lumber mill up Old Mill Road above present-day Lake Forest. Watson was among the handful of small companies operating during the first decades of the 20th century. None of these operations cut more than half a million board feet annually, and most operated for only a few years (Wilson 1992:60-61). Watson also harvested cedar for cedar shingles. Watson logged the area now known as the Highlands subdivision north of Lake Forest. The Watson Sawmill was located off Old Mill Road, one block north of SR 28. From 1927 to 1933, he harvested second-growth timber on about 240 acres that grew behind his mill (Van Etten, personal communication 2007, 2008). A schematic map attached to Knowles' (1942) *Lumbering History of the Truckee River Basin, 1856-1936* also shows a mill site (Number 140) along Burton Creek and near the corner of sections 25 and 36 (T16N/TR16E) and sections 30 and 31 (T16N/R17E).

Post-Logging Landscape

Following the intense period of logging in the Tahoe Sierra during the 19th century, a forester named John Leiberg (1902) mapped forest stands in the Tahoe and Truckee basins. Leiberg's (1902) maps shows land classification and density of standing timber. He designated timber tracts in the uplands of the Burton and Dollar creeks watershed as: "culled timber…merchantable timber less than 2,000 feet B.M. (board measure) per acre." In the project's general vicinity, he characterized the forest as 60 per cent harvested, with the sound sugar and yellow pine and Shasta (red) fir having been cut, leaving only stands of white fir. He described tracts south of Mt. Pluto Ridge above Burton Creek as follows:

> Tracts south of Mount Pluto Ridge, including slopes of main range: Shasta fir (red fir), 60 to 80 per cent; yellow pine (Jeffrey and/or ponderosa pine), 10 to 20 per cent; white fir, 10 to

> 30 per cent; incense cedar, and lodgepole pine; timber in medium close-set stands; fair quality; in most places difficult of access; average stand about 9,500 feet B.M.per acre. [Leiberg 1902:178]

Leiberg (1902:181) also described burned over areas throughout the Tahoe and Truckee basins, noting that many of the large uncontrolled fires appear to have followed the logging camps -- others antedated them. Big burns in proximity to the project area:

> …are found in the canyon of the Truckee River from the lake outlet down, on the southwestern slopes of Mount Pluto, on the terraces back of Carnelian Bay, and on the high ridges north of Agate Bay. Extensive fires have swept all these tracts, rarely, however, involving total destruction, but thinning the forest from 30 to 70 per cent and creating extensive brush growths.

In terms of forest reproduction after logging and/or fire, Leiberg (1902:182) noted that:

> …the slopes of Mount Pluto and the lake terraces north and northeast of the lake outlet, where a thick undergrowth has obtained a substantial foothold, reforestation is practically lacking…Shasta fir (red fir) is the leading species in the restockings at the higher elevations, white fir at lower altitudes, yellow pine appearing in smaller quantities than in the old forest; incense cedar is abundant, while sugar pine is practically obliterated. The grassy or weedy fire glades along the higher slopes of the main range are not reforesting, owing to the grazing and trampling of sheep…on many of the burned tracts the brush growths are giving way to dense masses of sapling white firs…

When logging ceased at the turn of the 19th-20th century, cutover lands were leased or sold to ranchers for grazing. Lake level lands generally supported cattle and high meadows were used for sheep. With no restrictions on grazing, sheepherders grazed their livestock at will and started persistent small fires in order to improve forage for the following season. During his trip in the vicinity of Burton Creek in 1914, travel writer George Wharton James (1992:108) noted bands upwards of 2,000 sheep herded by Basque shepherds and commented about the "carelessness on the part of shepherds, let alone their culpable neglect" when it came to setting fires along the range and "destroying the value of the mountains slopes as watersheds." Basque sheep grazing may have been curtailed in the lower Burton Creek watershed, however, due to controls over private land. To regulate overuse, the U.S. Forest Service began assigning allotments to individual permitees in the 1930s. The Antone Meadows/Burton Creek area (Figure 5) was one of the main Forest Service grazing allotments in the area (Lindström and Waechter 1996).

FISHERIES

Beginning in the 1860s, the fishing industry in the Tahoe Basin flourished initially and then declined rapidly. As soon as the Comstock opened in 1859, commercial fisherman in small boats began hauling in thousands of native trout, which were marketed to the mines and as far as San Francisco and Chicago. Indians reportedly netted large numbers of fish throughout the year, and these were sold to local innkeepers. Excessive commercial fishing, dam construction, disturbance of spawning grounds, obstruction of spawning runs, pollution of the watershed, and competition from introduced species combined to cause the demise of the native fishery by the 1920s. In the absence of native fish populations, programs intended to restore the sport fishery were based on

unrecorded stockings of exotic aquatic species; the subsequent hybridization, competition, predation, disease, and taking of spawn completely decimated the native cutthroat trout.

During the early 20th century, game warden Sydney Mandeville made Burton Creek a frequent regular stop on his patrols. His rounds ranged from the Tahoe-Truckee basins westward to San Francisco and eastward to Genoa and Gardnerville. His daily logs dating from 1911 are reproduced from the memoir of his sister, Vesta Mandeville (Mandeville 2001:174-177, 179-181, 186, 203, 209, 210, 213, 216-218, 242) and numerous entries pertain to trips to Burton Creek and/or the fishing grounds surrounding its mouth.

> Caught J.J. Burke & two others splashing about in Burton Creek with high boots on. They had long handled landing net & were trying to catch fish with this & with their hands. I shouted at them and made them come up to the road. Then gave them fair warning & law cards. Saw fellow trying to snag whitefish at the mouth of Burton Creek. (Asked J. M. Gale about F. A. Burris's license. Said I didn't care to see any more shipments without knowing the number of his license. [Mandeville 2001:176]

Tahoe Hatchery

The Board of Fish Commissioners was first established in 1870 as a response to the pollution of the rivers by the mining industry and the decline of the fishery. A series of fish hatcheries were constructed to mitigate the impacts. [ww.siegelstrain.com/project/tahoe-hatchery/] The California Fish Commission established the "Tahoe Hatchery", now situated at the junction of Lake Forest Road and SR 28 in the northern periphery of the Polaris-Pomin Wetland Project. Leitritz (1970:20-21) describes the initial operation where cold-water fish such as Lahontan Cutthroat Trout, Kokanee Salmon, Eastern Brook Trout, Rainbow Trout, and Brown Trout were reared.

> In the spring of 1889, Superintendent Woodbury, acting under instructions from the Board of Fish Commissioners, decided to locate a permanent hatchery on Lake Tahoe. The State had been carrying on hatchery operations under the direction of I. D. Frazier in a rented building which was not properly equipped to do good work. Each season a few hundred thousand Lahontan cutthroat eggs had been taken from fish seined from Lake Tahoe. The eggs were shipped to Shebley Hatchery in Nevada County and the fry returned to the Truckee and Tahoe region for distribution. After a study of possible hatchery locations, a site near Tahoe City [Lake Forest] was selected. Springs rising on the property constituted the water supply. Thirteen acres were first rented, and later purchased. Millions of Lahontan cutthroat trout were reared annually at this hatchery until 1916, except for the period 1891-1893. During this period the hatchery was not operated, due to dissention among members of the Board. [http://www.content.cdlib.org/view?docId=kt5k4004bd&brand=calisphere&doc.view=entire_text]

Figure 6. First Tahoe Fish Hatchery 1896 (photo adapted from Leitritz 1970)

Figure 6. Second Tahoe Fish Hatchery ca. 1920 (photo adapted from Leitritz 1970)

In 1920 the Board of Fish and Game Commissioners constructed the second fish hatchery on the site of the first hatchery. [https://tahoe.ucdavis.edu/tahoe-city-field-station] This structure is unique in a series of fish hatcheries designed by then-State Architect George McDougal. There is only one other similar building, [ttps://www.tahoedailytribune.com/news/renovation-of-old-fish-hatchery-planned/] located in Independence, California near Mount Whitney, which was designed after a Bavarian castle. The Tahoe Hatchery is more rustic, alpine chalet architecture, with cedar-bark siding that sets this building apart from others. [https://www.tahoedailytribune.com/news/renovation-livens-up-tahoe-fish-hatchery/] The building was designed to keep the temperature sufficiently cold for the cold-water fish. However, due to the colder Tahoe temperatures, the rate of fish growth was very slow and, therefore, the Tahoe Hatchery could not keep up with the increasing demand for larger fish. [https://tahoe.ucdavis.edu/tahoe-city-field-station] After new methods were developed for providing cold groundwater for the juvenile fish, this high-altitude hatchery became obsolete. [ttps://www.tahoedailytribune.com/news/renovation-of-old-fish-hatchery-planned/] Author John Steinbeck once worked as a caretaker at the hatchery, living in a cottage behind the main building. During this time completed his first novel, *Cup of Gold*. [/www.sierranevadageotourism.org/content/uc-davis-eriksson-education-center-at-the-historic-fish-hatchery/sie1D382EF665B58A36D] The State Department of Fish and Game closed the Tahoe Hatchery in 1956 but continued to occupy the building until 1975 when the UC Davis Tahoe Research Group scientists began using it as a base for research and field operations involving Tahoe's water quality. UC Davis ultimately purchased the site and raised $3 million for the renovations that are on-going today. The 3,000-square-foot main building (now known as the UC Davis Eriksson Education Center) comprises offices and a conference area, wet lab, scuba locker, workshop and storage. Outside, a path runs through upland and wetland demonstration gardens. Interpretive signs tell about native plants and wetlands wildlife, development impacts, the restoration of Polaris Creek and the importance of wetlands, as well as the research that is under way in local test plots. [/www.sierranevadageotourism.org/content/uc-davis-eriksson-education-center-at-the-historic-fish-hatchery/sie1D382EF665B58A36D]

COMMUNITY DEVELOPMENT

By the turn of the 19th-20th century lumbering diminished in significance and the fishery had been depleted. The land and lake used for these activities became more valuable for residential, commercial, and recreational purposes. Growth was further escalated with the entrance of automobiles into the Tahoe Basin around 1910 and the establishment during the 1930s of a statewide-network of engineered and major routes through the montane regions. As the Tahoe Basin attracted more interest and tourists, diverse resorts and rustic hotels appeared along the shores of the lake. Tahoe's backwoods became increasingly populated by recreationists. With the legalization of gambling in 1931 and the Winter Olympics in 1960, the burgeoning recreational and resort industry increasingly depended upon locally based services and personnel and prompted development of subdivisions and the continual expansion of Tahoe's infrastructure. During the 1970s, unprecedented levels of growth took place at Lake Tahoe. Communities comprised of year-round residences were stimulated by the availability of more reliable and widespread community sanitary water and sewer systems and organized garbage collection and landfills. The Polaris-

Pomin project area falls within the sphere of three of these historic communities: Lake Forest, Dollar Point/Dollar Hill and Tahoe City.

Lake Forest

The project area lies within the outskirts of the community of Lake Forest. The first settlement of the Lake Forest area came around 1859, when Homer D. Burton laid claim to the lakeside meadowlands of the creek that now bears his name (Van Etten 1987). Burton named his land Island Farm after a small hill exposed during low-water periods on the terminal end of a marshy spit of land (located due east of the Polaris-Pomin project area). Here, Burton developed and cultivated garden vegetables, buckwheat, and timothy hay. The 1874 von Leicht-Hoffmann map shows the word "Island" at this location (Figure 4 and 6). Wheeler's 1876 map designates the locale as "Island House." Burton's Island Farm could accommodate upwards of 30 guests. Two of Tahoe's first sailing vessels were placed in service by Burton in 1859-60 (Scott 1957:358, 1973:164). Lake Forest was a refueling stop for lake steamers, and a huge wharf, located near the present Coast Guard pier, was an over-water cache for cordwood. It took about four cords of wood per day to fuel a large steamer, much of it being harvested nearby and skidded to the wharf by teams of horses.

In the 1880s Burton sold his 300-acre farm to Antone Russi, a dairyman whose name graces the upstream meadows of the Burton Creek drainage, two miles to the northwest (Figure 5). Russi died in the 1890s, and his widow married dairyman Frank X. Walker, who then took over the farm and managed the cattle business successfully for two decades. Walker located his living quarters, corrals and milk house on the edge of the meadow where Tamarack Lodge was later built (Scott 1957:358). In 1910, after having owned Russi's property for more than a decade, Walker sold a parcel (which included the Burton home) to George Briggs of Sacramento. Matt Green subdivided this acreage, calling it Tahoe Island Park; later it was re-subdivided as Lake Forest by Henry Droste of Tahoe Realty, the first real estate office on the western side of the lake (R.H. Watson, personal communication 3/4/1958, in Scott 1957:358).

The settlement of Lake Forest grew up west of Burton's former lakeshore establishment. It borders on the old dog-leg of SR 28 between the Tahoe fish hatchery and Dollar Hill. It wasn't until the 1930s that Lake Forest supported any larger-scale commercial activity. Seasonal residences grew in number, supplied by milled lumber from the Snyder Lumber Company (founded in 1939). By 1946 local businesses were promoting an advertising campaign, reflecting the commercial upswing which Lake Forest enjoyed in the early postwar years. A post office opened in 1947 and signaled the sense of permanence for this primarily seasonal community. With the relocation in 1954 of SR 28 to shorten and straighten the Tahoe City approach to Dollar Grade, the horseshoe, now known as Lake Forest Road, was removed as a main thoroughfare and Lake Forest’s commercial core was bypassed.

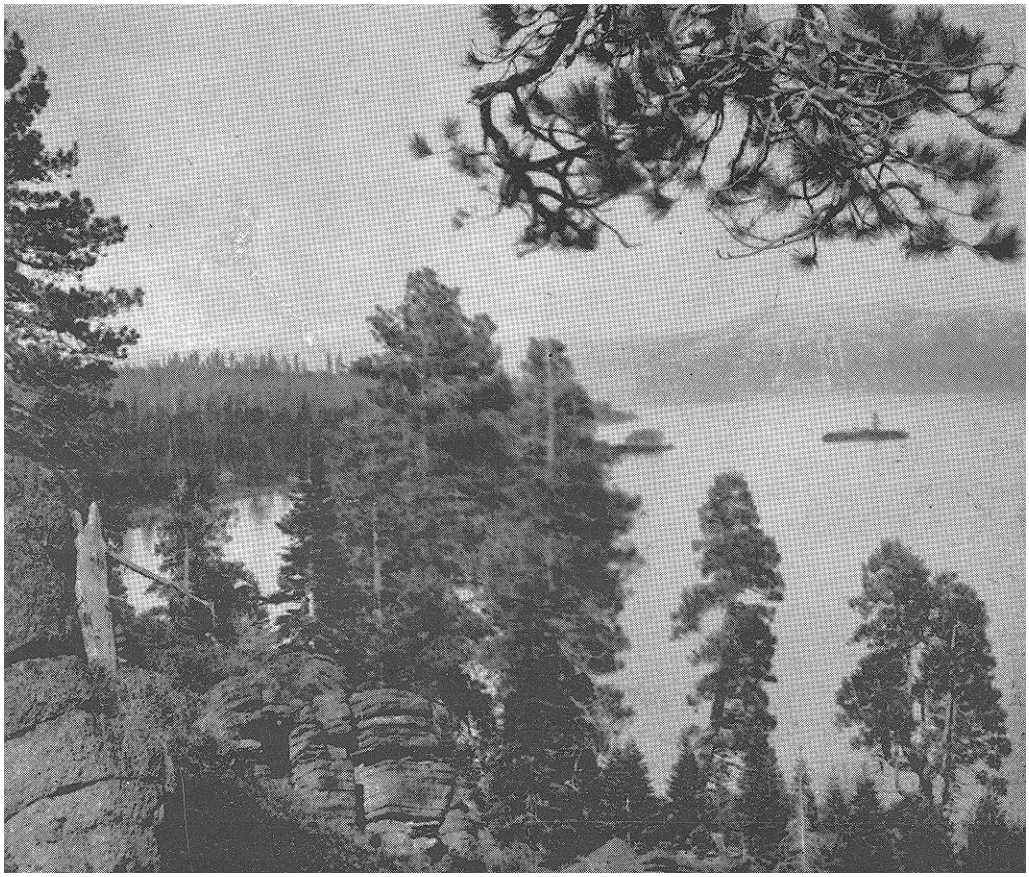


Figure 8. Burton's Island 1911; view southeast; house (left center) is part of an old wood camp located south of the mouth of Burton Creek (photo adapted from Scott 1957:356)

Rock quarries and sand and gravel pits associated with modern subdivision development surround Lake Forest. Van Etten (1987:47) describes a rock quarry at the site of Rocky Ridge properties near the northern end of the Polaris-Pomin Project area.

> In earlier days, the roadbed dipped much closer to the Lake as it rounded Vanni's Curve (the rock outcropping named for local stonecutter Ettore Vanni, who quarried much of his material there) near the Burton Creek bottomland.

Dollar Point

Over the decades, Dollar Point has carried a variety of names: Chinquapin, Griff's, Old Lousy, Observatory, and Wychwood. The appellation "Old Lousy" has at least two explanations that have bearing on its historic land use. Griffin, a land squatter and cordwood cutter in the area, was nicknamed "Old Lousy," as he allegedly never changed his clothes (Ernest Henry Pomin, Tahoe Park, 5/18/1955 in Scott 1957:496; Scott 1957:351). An alternative derivation comes from the notion that the waters off the promontory were considered "lousy" with trout (Robert H. Watson, Lake Forest, 9/2/1955 in Scott 1957:496). The name "Observatory Point" was coined in 1873 when James Lick, the San Francisco philanthropist, offered to appropriate $1,000,000 for the construction of a large observatory there (figures 4 and 5). An added incentive in this venture was the boost given

by the Carson and Tahoe Lumber and Fluming Company (owners of a half section of land at Dollar Point), which generously agreed to donate 140 acres to James Lick if his plans materialized (Scott 1957:351). Upon the death of lumber company founder D. L. Bliss in 1906, the land at Dollar Point was turned over to his heirs (Scott 1957:353). In 1915 Mrs. Lora Moore Knight acquired the property and built her first Tahoe home, calling it Wychwood. Dollar Creek supplied power and water for domestic use to Lora J. Moore's (Knight) Dollar Point home and outbuildings ca. 1919 and 1920 (NTPUD Files "Water Rights License Application #A000753 License #000107, Dollar Creek in Lindström 2017). The Knight family friend, Charles Lindberg, flew in supplies for the Dollar Estate on a sea plane. Lora Moore Knight lived at her Dollar estate while building her famous Vikingsholm Castle at Emerald Bay in the early 1920s. Moving to Emerald Bay in 1927, she sold the Dollar Point property to Robert Stanley Dollar, Sr., after whom Dollar Point and Dollar Hill are named.

Dollar Hill and the Highlands Subdivision

The Highlands Subdivision was developed by realtors Else and Howard Martin on Dollar Hill sometime during the early 1950s (Anita Ormsby, personal communication in Lindström and Betts 2007). On the 1955 USGS Kings Beach Quad, only the two lower residential road tiers are shown. By 1969 the photo-revised USGS quad map depicts the subdivision nearly built-out and golf course fairways are present. Grand plans included a pool and a nine-hole golf course and small clubhouse known as Highland Greens (Anita Ormsby, personal communication in Lindström and Betts 2007; Van Etten 1987). However, the development lost profits on the golf course (Bill Conners, personal communication with Carol Van Etten 1987). A sprinkler system was installed and there were fairways with grass, but the course had its problems with design and terrain, given the abundance of rock and trees that obstructed golf holes. The course may never have been opened commercially and it closed sometime during the mid-1970s (Anita Ormsby, personal communication in Lindström and Betts 2007), after which time the Tahoe City Public Utility District took over the property and reseeded the golf fairways (Beckman, personal communication in Lindström and Betts 2007). The clubhouse was later enlarged to accommodate the Nordic ski facility, which operates on the abandoned golf greens (Mary Anna Conners, personal communication with Carol Van Etten, 1987).

Tahoe City

In the summer of 1861, the first Euroamerican of record settled in a locale that would shortly become Tahoe City. The town site was laid out sometime after 1863 by a party of men disenchanted by the unprofitable flash of mining excitement near Squaw Valley. The settlement was known in 1864 as "Trucky River P.O." The townsite became official in 1868. In 1871 the post office was known as "Tahoe." The name "Tahoe" was not officially changed to "Tahoe City" until 1949 (Scott 1957:26, 473).

A meadow, which is now part of the Tahoe City Golf Course, once extended from the lake outlet northeastward to what is now Rocky Ridge Properties near Lake Forest. Beginning in 1862, wild timothy hay was harvested from this fertile cropland. William Ferguson and James Tracey from Squaw Valley pre-empted 800 acres of land north of Tahoe City, calling it the Tahoe Ranch. Their property adjoined Homer D. Burton's Island Farm at Lake Forest (Scott 1957:26). Their haying operation was a financial success, as the production of feed for livestock was an essential link in the harvest of Tahoe lumber to support the silver mines of the Comstock (Van Etten 1987:8).

Fishing became an increasing attraction for both anglers and tourists to Tahoe City and a commercial hatchery was established at the lake outlet where fishing boats were rented out of the establishment. In 1887 the *Truckee Republican* (5/4/1887) reported:

> The fish hatchery at Tahoe [City], constructed by Commodore Todman, is about to commence active operations. Spawn will be taken next week and it is expected that a million young fish will be put into the lake this season.

Growing tourism supported the establishment of local inns and hotels. Beginning in 1900, Tahoe City served as a gateway port to Lake Tahoe. With the decline of the Comstock mines and the demise of timbering in the Tahoe Basin, the Bliss family (of Carson and Tahoe Lumber and Fluming Company fame) formed a new corporation, the Lake Tahoe Railway and Transportation Company. Dismantled railroad logging tracks and rail cars were repurposed into a 15-mile narrow gauge line down the Truckee River canyon between Tahoe City and the main transcontinental railroad at Truckee (Figure 5). The simultaneous opening of their tourist railroad in 1900 and their internationally famous Tahoe Tavern Resort and railroad-steamer pier in 1902 (Figure 5) was followed by resort expansions and the Tavern's opening of a golf course in 1917. The golf course was located at the former timothy hay meadow and present location of the Tahoe City Golf Course. Operations required large supplementary sources of water (Van Etten 1987:13, 56) and both resort and golf course were supplied with water from Burton Creek. In 1925 the narrow-gauge railroad was leased to the Southern Pacific Railroad and the line was converted to standard gauge.

The Tavern maintained an undisputed reputation as "the place to go at Tahoe" (Van Etten 1987:12) until World War II. The railroad line was abandoned in 1943, coinciding with restrictions on non-essential travel during the war and the movement of more automobile traffic over local roads and highways (Myrick 1962:436). By the early 1960s, environmental regulations and the inevitability and expense of connecting to the new sewer system on Tahoe's west shore spelled the resort's ultimate demise; it was demolished in 1964.

Water and Waste Management

The longed-for commercial and residential boom on Tahoe's north shore prompted more organized municipal infrastructure, expanded organized garbage collection and landfills, and more sophisticated water supply systems to keep pace with development.

Initially, water supply systems for Tahoe's north shore developed in a random fashion. Remnants of these early systems are represented in the project vicinity by water impounding dams, wooden box flumes, earthen ditches, and pipeline that once supplied Tahoe City residents with water from Burton Creek and residents of Dollar Point from Dollar Creek.

Growth was accompanied by a proliferation of unwanted garbage. In the early days there was no organized refuse collection system nor was there an awareness of the potential hazards of chemical wastes. For matters of convenience, residents and merchants burned or buried what they could and widely broadcast their remaining household and commercial garbage, especially along dirt roadsides leading out from community outskirts. Van Etten (1987:47) noted that the area's early organized dumping grounds were all accompanied by a companion operation -- the raising of hogs. During the early to mid-1940s, garbage from the Tahoe Tavern was taken to the island off Lake Forest beach, which was then part of the Tavern holdings. This piece of real estate, listed

on the tax rolls as four-tenths of a deeded acre, provided enough dry ground in low-water years to accommodate a modest herd of swine. Garbage was transported by barge to "Pig Island" for consumption by pigs until they had attained sufficient size for butchering. Nearby Hog Pen Hill, located below the present site of Rocky Ridge properties in the Burton Creek bottomland, was also a pig farm. Tom Walker owned the herd and his nearby dairy supplied quantities of milk for the pigs, supplemented by garbage picked up from the local restaurants and hotels.

During the 1960s-1970s, unprecedented levels of growth took place at Lake Tahoe, stimulated by the availability of more reliable and widespread community sanitary water and sewer systems, which culminated in the late 1970s with all sewage and solid wastes centrally collected and exported outside the basin. Because small independent utilities systems were unable to supply enough sanitary water or sewage or garbage collection, and most of these older systems along Tahoe's north shore were eventually consolidated either under the Tahoe City Public Utility District (TCPUD) or the North Tahoe Public Utility District (NTPUD).

North Tahoe Public Utility District

The North Tahoe Public Utility District (NTPUD) was formed in 1948, with sewage treatment facilities completed in 1957 (NTPUD Master Water Plan 1987 in Lindström 2017). The water supply systems developed to supply water only in the summer to vacation cabins and water service was not in full operation until 1967. The District owns, operates and maintains three physically and geographically separate water systems serving the communities of Kings Beach, Carnelian Bay and Dollar Cove (Chinquapin). The District purchased the Dollar Cove Water system at Chinquapin in 1977. Use of the Chinquapin property dates to ca. 1917, with water rights acquired in 1929 when all rights were transferred to Stanley Dollar (Suzi Gibbons, personal communication 9/19/17 in Lindström 2017). The NTPUD draws water from Dollar Creek to supplement the Dollar Cove System. Dollar Reservoir was built for power generation, which ceased sometime prior to 1969, with only domestic water use since then.

Tahoe City Public Utility District

The Tahoe City Public Utility District (TCPUD) was founded by Carl A. Bechdolt and Henry F. Droste in 1939. Initially it served a square mile area centered upon Lake Tahoe's outlet (Vernon n.d.:4). In 1953 the District constructed a sewage collection, treatment and disposal system that was put into operation by 1954. The TCPUD now provides water, sewer and parks and recreation services to the north and west shores of Lake Tahoe, including the Dollar area and Lake Forest (Lindström et al. 2016).

Despite Burton Creek's modest flows, it played an important role in the development of Tahoe City. Tahoe City's earliest water system was drawn directly from creeks and springs within or adjoining the fledgling settlement. In 1900, with the construction of the Tahoe Tavern Resort and the Lake Tahoe Railway and Transportation Company's narrow-gauge railroad, the existing springs were found to be an insufficient water supply (Van Etten 1987:12). The purity of the resort's shoreline water supply was contaminated by large watercraft that frequented the Tavern pier and Burton Creek afforded the closest dependable water supply. Developing this source of water and delivering it to the Tavern involved the construction of two reservoirs on Burton Creek and several miles of connecting pipeline, which diverted water overland to Bliss Creek and down to the bottom of Grove Street, where it followed the lake bottom in a gravity feed to the resort.

The Bliss enterprise commenced development of their waterworks (a dam, flume, pipeline, and ditch) on Burton Creek in 1901 (Vernon n.d.:2-3), although the actual appropriation of Burton Creek water was not established until 1907. Bliss secured additional water rights on Burton Creek in 1907 by constructing a "small dam" and securing a permanent right-of-way on land owned by Frank X. Walker and his wife Maria L. Russi (Correspondence: Dille to Antonucci 1983 in Lindström 2008). In 1916 the Bliss family heirs sold their Burton Creek land holdings to Lora (Moore) Knight (Vernon n.d.; Appendix A), agreeing to supply her 80,000 gallons of water per day (Correspondence: Kronick, Moskovitz & Vanderlaan 1963b:6 in Lindström 2008). In 1928 Ms. Knight conveyed her Burton Creek holdings to Stanley Dollar.

By April of 1922, the Lake Tahoe Railway and Transportation Company owned all interests in Burton Creek water. Over the course of the next two decades water rights to Burton Creek passed from the Bliss interests through several individuals and corporations, with majority rights ending up with owners of the Tahoe Tavern and the Tahoe City Golf Course (Correspondence: Kronick, Moskovitz & Vanderlaan 1963b in Lindström 2008). The report (Correspondence: Scammon to State Water Rights Board 9/6/1962 in Lindström 2008) described miscellaneous dam repairs, as well as the sources of Burton Creek, being several springs upstream from the dam. The report stated that all of Burton Creek water was being used to irrigate the Tahoe City Golf Course, formerly owned by the Lake Tahoe Railway and Transportation Company. In 1948 the Tahoe Tavern Golf Course was acquired by Carl Bechdolt, Sr., co-founder of the TCPUD. Throughout its existence, irrigation waters for the golf course have come from Burton Creek.

The TCPUD became successors in interest to Tahoe Tavern properties and acquired an undivided interest in certain facilities that comprised the Burton Creek water system. The TCPUD considered acquisition of the Burton Creek water system in 1972 but declined, given the deterioration of water works facilities and potential liability (Correspondence: TCPUD 1972 in Lindström 2008).

METHODS

To perform the cultural resource study, Balance Hydrologics, Inc. contracted with Susan Lindström, Ph.D., Consulting Archaeologist. Dr. Lindström (RPA) has over 44 years of professional experience in regional prehistory and history, holds a doctoral degree in anthropology/archaeology and since 1982 has maintained certification by the Register of Professional Archaeologists (RPA, former Society of Professional Archaeologists/SOPA). She exceeds the Secretary of Interior's Professional Qualifications Standards (48 FR 44738-44739) in these and related disciplines (resume in Appendix 3). Devin Blom, Battle Born GIS, prepared project maps.

Peter Kulchawik, M.S., P.E., Balance Hydrologics, Inc. provided helpful project background materials, including USGS topo maps, and high-quality aerial photographs and drone images.

Although the intent of the study was limited to an "arm-chair" records review and initial Native American outreach, on October 22, 2018 a cursory field tour/windshield survey of selected sections of the Polaris-Pomin wetlands restoration area was conducted (to included parking areas for the Robert Pomin Park ballfield, Lake Forest Boat Ramp and Lake Forest Campground and the

access road into the complex). Examination of high-quality aerial photos and available drone coverage offered the best overview of the project.

ARCHIVAL RESEARCH AND RECORDS REVIEW

A variety of research sources were consulted in the preparation of the report's historic context. While funding constraints limited the research scope to mainly secondary sources, a number of primary sources on file in the personal library of the report's author were also reviewed (e.g., historic maps, water rights files, lumber company records, land ownership documents, etc.). Some of the archival sources checked are listed below and others are cited in the report bibliography.

- Archived documents curated by the North Lake Tahoe Historical Society at the Gatekeeper's Museum in Tahoe City include: manuscript and photo files cataloged by historic theme, geographic area and historic personalities; local newspapers; and miscellaneous files.
- D. L. Bliss family records and company records of the Carson Tahoe Lumber and Fluming Company and the Lake Tahoe Railway and Transportation Company curated by Special Collections of the Getchell Library at the University of Nevada-Reno.
- Tahoe City Public Utilities District (TCPUD) files on the acquisition of various independent water systems around Lake Tahoe including: (a) manuscript on the History of Tahoe City's Water Supply" (b) "Evaluation of the Burton Creek Water System" and (c) various materials and documents pertaining to Burton Creek water rights.
- Personal communications with Carol Van Etten, Tahoe City Historian.
- Personal communication with Mazie (Walker) Carnell, granddaughter of Frank X. Walker (Burton Creek pioneer) and daughter of Tom Walker, Sierraville. Mazie was born in 1927.
- Personal communications with John Fulton, Fulton Water Company, Cedar Flat (Lake Tahoe).
- "Fish and Game Logs" and official correspondence of Sydney Mandeville (1908-1913) published in his sister's memoir (Mandeville 2001); personal recollections provide a social and environmental history of the Tahoe and Truckee basins during the first half of the 20th century.
- Historic maps.
    - DeGroot's Map of Nevada Territory, 1863
    - General Land Office Survey (GLO) Plat, 1865
    - Map of the Placerville Route, ca. 1867-1868
    - Topographic Map of Lake Tahoe and Surrounding Country, 1874
    - Lake Tahoe 1876, Expedition of 1876 & 1877 under the Command of G.M. Wheeler
    - USGS Truckee Sheet, 1897 (Reprint 1914)

- Tahoe National Forest, 1915, 1921, 1926
- Eldorado National Forest, 1926, 1949
- USGS Truckee Quadrangle, 1940
- USGS Truckee Quadrangle, 1940 (Reprint 1951)
- USGS Tahoe 15' Quadrangle, 1955
- USGS Tahoe City 7.5' Quadrangle, 1955
- Lake Tahoe Basin, 1961
- Truckee District, Tahoe National Forest, 1962
- USGS Tahoe City Quad 1955 (PV 1969)
- Lumbering History of the Truckee River Basin, 1856-1936 (Knowles 1942)
- Logging Areas in the Lake Tahoe Basin 1955-1968

PRIOR ARCHAEOLOGICAL STUDIES AND KNOWN CULTURAL RESOURCEES

An in-house records search was conducted by the North Central Information Center (NCIC), a branch of the California Historical Resources Information System (CHRIS) and adjunct of the State Office of Historic Preservation (OHP). Records within the project area were reviewed by NCIC staff to identify any properties listed on the National Register, California Register and other listings, including the Office of Historic Preservation files and the following sources (NCIC File No.: PLA-18-101; see Appendix 1).

- ✓ *California Inventory of Historical Resources*
- ✓ *California State Historical Landmarks*
- ✓ *National Register of Historical Places/California Register of Historic Resources listings*
- ✓ *Office of Historic Preservation Historic Property Data File (updates)*
- ✓ *Determination of Eligibility (updates)*
- ✓ *Points of Historic Interest*
- ✓ *Caltrans Bridge Inventory*
- ✓ *Historic Spots in California*

NCIC records search results disclosed that 10 prior archaeological studies have been conducted within the current Polaris-Pomin Wetland Complex Project area. Five additional studies have occurred within a 1/8-mile search radius (as shown in Table 1 and on Figure 3). While these prior studies have covered much of the project area, most were limited to records review (i.e., *Phase 1A*). The project has never been subjected to a complete and systematic archaeological field survey (i.e., *Phase 1B*).

Table 1. Prior archaeological studies within and/or near the project area

Report #	*Author(s)/Year*	*Title*	*Study Location*
4389	Woodward/1991b	Archaeological Inventory surveys of the Tahoe State Recreation Area	Within project area
7290	Wulf/2006a	Supplemental Historic Property Survey Report for the Proposed Roadway Rehabilitation and	Within project area

		Drainage System Improvement Project on State Route 28 from Tahoe	
7290B	Wulf/2006b	Supplemental Archaeological Survey Report for the Proposed Roadway Rehabilitation and Drainage System Improvement Project on SR 28 from Tahoe City to the Nevada State Line	Within project area
7290C	Wulf/2006c	Environmentally Sensitive Area Action for the Proposed Roadway Rehabilitation and Drainage System Improvement Project on SR 28 from Tahoe City to the Nevada State Line	Within project area
8072	Wulf & St. John/2004	Historic Property Survey Report for the Proposed Roadway Rehabilitation and Drainage System Project on State Route 28 from Tahoe City to the Nevada State Line	Within project area
8072B	Wulf/2004	Archaeological Survey Report for the Proposed Roadway Rehabilitation and Drainage System Project on State Route 28 from Tahoe City to the Nevada State Line	Within project area
8072C	St. John/2004	Historical Resources Evaluation Report for the Proposed Roadway Rehabilitation and Drainage System Project on State Route 28 from Tahoe City to the Nevada State Line	Within project area
9326	Leach-Palm 2008	Cultural Resources Inventory of Caltrans District 3 Rural Conventional Highways in Butte, Colusa, El Dorado, Glenn, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, and Yuba Counties	Within project area
10005	Chambers Group et al./2007	Cultural Resource Inventory of Area B for the Lake Forest Erosion Control Project	Within project area
11372	Lindström.2013	SCB Boat Ramp Rehabilitation Project Lake Forest, Heritage Resource Inventory and Evaluation	Within project area
4388	Woodward/1991a	Archaeological Inventory surveys of Burton Creek State Park	Within 1/8-mi radius
8630	Jaffke 2006	Archaeological Survey Report for the Riparian Hardwoods Restoration Project	Within 1/8-mi radius
10914	Peak & Associates/2011	Cultural Resource Assessment of the Lake Forest Water Company's Acquisition and Water System Reconstruction Project	Within 1/8-mi radius
11348	Waggoner/2013	North Tahoe Hazardous Fuels Reduction and Defensible Space Project North Tahoe fire Protection District	Within 1/8-mi radius

11884	Silverston et al./2015	Cultural Resources Survey Report, Burton Creek State Park	Within 1/8-mi radius

Five cultural resources have been recorded within the 1/8-mile search radius and two cultural resources have been inventoried within the Polaris-Pomin Project area (listed in Table 2 and shown on the map in the Confidential Appendix). One prehistoric lithic scatter (P-31-414/CA-PLA-288) was first identified in 1978 and again in 1988 in the far southwestern corner of the project area east of the mouth of Burton Creek. Its content and integrity (i.e., existence) remain unconfirmed. Since the site was last observed over 30 years ago, physical remains now require field assessment as part of the next phase of the project (*Phase 1B*).

The second archaeological site is the historic (1963) Lake Forest Boat Ramp (P-31-5660), located within the project area along Lake Tahoe's shoreline near the mouth of Polaris Creek. The resource was inventoried and evaluated and recommended ineligible for listing in National Register of Historic Places or California Register of Historical Resources, to which the lead review agency (U.S. Army Corps of Engineers) concurred (Lindström 2013). Therefore, the Lake Forest Boat Ramp need not be considered further in the environmental review process.

Table 2. Summary Known Cultural Resources Within/Adjacent to Project Area

Resource No.	*Resource Type*	*Report No.*	*Location*
P-31-414; CA-PLA-288	Prehistoric lithic scatter	4389; 10005	Within project area
P-31-5660	Lake Forest Boat Ramp	11371	Within project area
P-31-415; CA-PLA-289	Prehistoric lithic scatter	4389; 10005	Within 1/8-mi radius
P-31-5784; CA-PLA-1889	Prehistoric lithic scatter	11884	Within 1/8-mi radius
P-31-5793; CA-PLA-251H	Historic refuse scatter; historic road/trail	11884	Within 1/8-mi radius

NATIVE AMERICAN CONSULTATION

Initial Native American outreach was accomplished according to CEQA guidelines and mandates under California Assembly Bill 52 (pursuant to PRC 21080.3.1). A request for a sacred lands file search was directed to the Native American Heritage Commission on October 12, 2018 and a response and follow-up contact list was received on October 23rd. Although the Commission identified no Native American cultural resources in the immediate project area, follow-up contacts to incorporate opinions, knowledge and sentiments regarding the project were advised:

> …the absence of specific site information in the Sacred Lands Files does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites… [Correspondence: Native American Heritage Commission to Susan Lindström 10/23/18]

Follow-up correspondence was sent to the five tribes on the Commission's contact list (Colfax-Todds Valley Consolidated Tribe, Shingle Springs Band of Miwok Indians, Tsi-Akim Maidu, United Auburn Indian Community of the Auburn Rancheria, and Washoe Tribe of Nevada and California). These five groups were notified by mail and email on December 3rd. The United Auburn Indian Community acknowledged receipt of the project information in a December 10th email and agreed to circulate it amongst tribal members. A follow-up phone call to the Washoe Tribe on December 11th resulted in receipt of their formal comments in a memo dated December 11th. A follow-up phone call to the Shingle Springs Band of Miwok Indians on December 11th resulted in their formal comments in a memo dated December 12t.h. Neither group indicated any direct knowledge of Native American resources within the project area, but both asked to be kept informed as project plans proceed. Follow-up telephone communications to the remaining groups were made on December 11th. No direct contact was made with the Colfax-Todds Valley Consolidated Tribe or Tsi-Akim Maidu and they were re-notified of the project via voice mail. A summary communications log is listed in Table 3 and relevant Native American correspondence is contained in Appendix 2.

Table 3. Summary of Native American Communications

Tribe	**Contact Date**	**Comments**
Native American Heritage Commission	10/12/18; 10/23/18	Request search of Sacred Land Files; Response/contact list received
Colfax-Todds Valley Consolidated Tribe	12/4/18; 12/11/18	Mailed/emailed project information; Follow-up phone call, left voice mail
Shingle Springs Band of Miwok	12/4/18; 12/11/18; 12/12/18	Mailed/emailed project information; Follow-up phone call; left voice mail; Response memo received
Tsi-Akim Maidu	12/4/18; 12/11/18	Mailed/emailed project information; Follow-up phone call, left voice mail
United Auburn Indian Community	12/4/18; 12/10/18	Mailed/emailed project information; Tribe acknowledged receipt of information

Washoe Tribe	12/4/18; 12/11/18; 12/11/18	Mailed/emailed project information; Follow-up phone call; Response memo received

CONCLUSIONS AND RECOMMENDATIONS

Environmental review policies that comply with guidelines established by CEQA (Section 5024, Public Resources Code) and TRPA (Code of Ordinances Chapter 67), require that a cultural study be performed to inventory any prior archaeological studies, known cultural resources and Native American traditional properties within a proposed project. With the completion and submittal of this *Phase 1A* preliminary report, state, county and regional requirements for the first phase of a cultural resource inventory have been accomplished.

FINDINGS

Native American outreach has been accomplished according to CEQA guidelines and mandates under California Assembly Bill 52 (pursuant to PRC 21080.3.1). No specific project concerns have been identified.

Archaeological records review identified two known cultural resources within the approximate 22-acre Polaris-Pomin restoration site.

> One prehistoric lithic scatter (P-31-414/CA-PLA-288) was first identified in 1978 and again in 1988 in the far southwestern corner of the project area east of the mouth of Burton Creek. Its content and integrity (i.e., existence) remain unconfirmed. Since the site was last observed over 30 years ago, physical remains now require field assessment as part of the next phase of the project.
>
> The second archaeological site within the project area is the historic (1963) Lake Forest Boat Ramp (P-31-5660), located along Lake Tahoe's shoreline near the mouth of Polaris Creek. The resource was inventoried and evaluated and found ineligible for listing in both the National Register of Historic Places and the California Register of Historical Resources. Therefore, the Lake Forest Boat Ramp need not be considered further in the current environmental review process.

RECOMMENDATIONS FOR FURTHER WORK

Phase 1A prefield research is the first step in a cultural resource protocol. This step has been accomplished with the completion of this report. Recommendations for further archaeological are as follows.

- Pending selection of the alternative project relocation areas, an updated *Phase 1A* records search with the North Central Information Center and Native American Heritage Commission should be completed for each alternative area.

- *Phase 1B* field surveys of the 22-acre restoration site and each alternative relocation area should follow.
- All cultural resources encountered should be field documented, including the prehistoric lithic scatter, site P-31-414/CA-PLA-288 (*Phase 1C*).
- If cultural properties are present and subject to project-related impacts, their significance should be evaluated according to eligibility criteria established in the National Register of Historic Places and/or California Register of Historical Resources (*Phase 2*).
- If project redesign to avoid impacts to eligible resources is unfeasible, then mitigation measures should be implemented (*Phase 3*).
- If additional cultural resources are discovered during project construction, project activities should cease near the find and the project sponsor should consult a qualified archaeologist for recommended procedures. A registered professional archaeologist (RPA) should be on-call during project ground-disturbance activities.
- In the unlikely event that human remains are encountered, all activities should stop, and the County Coroner's Office should be contacted.

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2013 North Tahoe Hazardous Fuels Reduction and Defensible Space Project North Tahoe Fire Protection District. Report (NCIC #11348) on file North Central Information Center, California State University, Sacramento.

Washoe Tribal Council

1994 Comprehensive Land Use Plan. Report on file Tribal Government Headquarters. Gardnerville.

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Wulf, Erick

2004 Historic Property Survey Report for the Proposed Roadway Rehabilitation and Drainage System Project on State route 28 from Tahoe City to the Nevada State Line. Report (NCIC #8072B) on file North Central Information Center, California State University, Sacramento.

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Wulf, Erick and Gail St. John

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APPENDIX 1

North Central Information Center Correspondence

California Historical Resources Information System

NORTH CENTRAL INFORMATION CENTER

AMADOR
EL DORADO
NEVADA
PLACER
SACRAMENTO
YUBA

California State University, Sacramento
6000 J Street, Folsom Hall, Suite 2042
Sacramento, California 95819-6100
phone: (916) 278-6217
fax: (916) 278-5162
email: ncic@csus.edu

10/19/2018

NCIC File No.: PLA-18-101

Susan Lindstrom
Consulting Archaeologist
P.O. Box 3324
Truckee, CA 96160

Re: Polaris-Pomin Wetland Complex Project

The North Central Information Center received your record search request for the project area referenced above, located on the Kings Beach USGS 7.5' quad. The following reflects the results of the records search for the project area and a 1/8-mi radius.

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☒ custom GIS maps ☐ shapefiles

Resources within project area:	P-31-414 P-31-5660
Resources outside project area, within radius:	P-31-415 P-31-5784 P-31-5793
Reports within project area:	4389 7290 8072 9326 10005 11372
Reports outside project area, within radius:	4388 8630 10914 11348 11884

Resource Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed/NA
Resource Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed/NA
Resource Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed/NA
Report Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed/NA
Report Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed/NA
Report Copies:	☐ enclosed	☒ not requested	☐ nothing listed/NA

OHP Historic Properties Directory:	☒ enclosed	☐ not requested	☐ nothing listed/NA
Archaeological Determinations of Eligibility:	☒ enclosed	☐ not requested	☐ nothing listed/NA
CA Inventory of Historic Resources (1976):	☒ enclosed	☐ not requested	☐ nothing listed/NA
Caltrans Bridge Survey:	☐ enclosed	☐ not requested	☒ nothing listed/NA
Ethnographic Information:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Historical Literature:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Local Inventories:	☐ enclosed	☐ not requested	☒ nothing listed/NA
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Shipwreck Inventory:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Soil Survey Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Sincerely,

Paul Rendes, Assistant Coordinator
North Central Information Center

APPENDIX 2

Native American Correspondence

Susan Lindström, Ph.D.

Consulting Archaeologist

P.O. Box 3324

Truckee CA 96160

530-587-7072

susanglindstrom@gmail.com

DATE: October 12, 2018

TO: Native American Heritage Commission

1550 Harbor Boulevard, Suite 100

West Sacramento, CA 95691

916-373-3710; 916-373-5471 (fax)

nahc@nahc.ca.gov

RE: Polaris-Pomin Wetlands Complex Project

Cultural Resource Study

I am writing to request a records search of the Sacred Land Files. The Tahoe Resource Conservation District (TRCD) proposes to investigate restoration potential and relocated and/or modified recreational alternatives of the Robert Pomin Park, Lake Forest Campground, and associated parking spaces. Wetlands on the approximate 22-acre restoration area containing the park, campground and parking lot would be restored and up to three alternatives (no larger than five acres in size) would be analyzed for their suitability in terms of park relocation. The project would be administered by the TRCD, in coordination with Placer County, the Tahoe City Public Utility District, and the California Department of Parks and Recreation (DPR).

The project area is in Township 16 North, Range 17 East, Section 33-32 and Township 15N/Range 17 East/Section 5 M.D.B.M. (see accompanying map).

I wish to bring this project to your attention and I invite your opinions, knowledge and sentiments regarding any potential concerns for traditional Native American lands within the project vicinity.

Thank you very much.

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

October 23, 2018

Susan Lindstrom
Consulting Archeologist

Sent by Email: susanglindstrom@gmail.com
Number of Pages: 2

RE: Trout Unlimited Truckee River Stream Enhancement Addition, Kings Beach, Placer County

Dear Ms. Lindstrom:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. **Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.**

I suggest you contact all of those listed, if they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. **By contacting all those on the list, your organization will be better able to respond to claims of failure to consult**. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: Sharaya.Souza@nahc.ca.gov.

Sincerely,

Sharaya Souza
Staff Services Analyst
(916) 573-0168

OHP Historic Properties Directory:	☒ enclosed	☐ not requested	☐ nothing listed/NA
Archaeological Determinations of Eligibility:	☒ enclosed	☐ not requested	☐ nothing listed/NA
CA Inventory of Historic Resources (1976):	☒ enclosed	☐ not requested	☐ nothing listed/NA
Caltrans Bridge Survey:	☐ enclosed	☐ not requested	☒ nothing listed/NA
Ethnographic Information:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Historical Literature:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Local Inventories:	☐ enclosed	☐ not requested	☒ nothing listed/NA
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Shipwreck Inventory:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Soil Survey Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Sincerely,

Paul Rendes, Assistant Coordinator
North Central Information Center

Susan Lindström, Ph.D.

Consulting Archaeologist

P.O. Box 3324

Truckee CA 96160

530-587-7072

530-713-1920 (cell)

susanglindstrom@gmail.com

DATE: December 4, 2018

TO: Pamela Cubbler, Treasurer (Clyde Prout, Chairman)

Colfax-Todds Valley Consolidated Tribe

P.O. Box 4884

Auburn, CA 95604

pcubbler@colfaxrancheria.com (miwokmaidu@yahoo.com)

530-320-3943; 530-367-2093 (home); (916-577-3558)

RE: Polaris-Pomin Wetlands Complex Project

The Tahoe Resource Conservation District (TRCD) proposes to investigate restoration potential and relocated and/or modified recreational alternatives of the Robert Pomin Park, Lake Forest Campground, and associated parking spaces. Wetlands on the approximate 22-acre restoration area containing the park, campground and parking lot would be restored and up to three alternatives (no larger than five acres in size) would be analyzed for their suitability in terms of park relocation. The project would be administered by the TRCD, in coordination with Placer County, the Tahoe City Public Utility District, and the California Department of Parks and Recreation (DPR). The project area is in Township 16 North, Range 17 East, Section 33-32 and Township 15N/Range 17 East/Section 5 M.D.B.M. (see accompanying map).

I am following up on the Native American Heritage Commission's recommendation to reach out to tribes/individuals that may have information about this project. I wish to bring this project to your attention and I invite your opinions, knowledge and sentiments regarding any potential concerns for traditional Native American lands within the project vicinity.

Thank you very much.

Susan Lindström, Consulting Archaeologist

Susan Lindström, Ph.D.

Consulting Archaeologist

P.O. Box 3324

Truckee CA 96160

530-587-7072

530-713-1920 (cell)

susanglindstrom@gmail.com

DATE: December 4, 2018

TO: Regina Cuellar, Chairperson

Shingle Springs Band of Miwok Indians

P.O. Box 1340

Shingle Springs, CA 95682

rcuellar@ssband.org; 530-387-4970

RE: Polaris-Pomin Wetlands Complex Project

The Tahoe Resource Conservation District (TRCD) proposes to investigate restoration potential and relocated and/or modified recreational alternatives of the Robert Pomin Park, Lake Forest Campground, and associated parking spaces. Wetlands on the approximate 22-acre restoration area containing the park, campground and parking lot would be restored and up to three alternatives (no larger than five acres in size) would be analyzed for their suitability in terms of park relocation. The project would be administered by the TRCD, in coordination with Placer County, the Tahoe City Public Utility District, and the California Department of Parks and Recreation (DPR). The project area is in Township 16 North, Range 17 East, Section 33-32 and Township 15N/Range 17 East/Section 5 M.D.B.M. (see accompanying map).

I wish to bring this project to your attention and I invite your opinions, knowledge and sentiments regarding any potential concerns for traditional Native American lands within the project vicinity.

Thank you very much.

Susan Lindström

Consulting Archaeologist

SHINGLE SPRINGS BAND
OF MIWOK INDIANS

Shingle Springs Rancheria
(Verona Tract), California
5168 Honpie Road
Placerville, CA 95667
Phone: 530-676-8010
shinglespringsrancheria.com

CULTURAL RESOURCES

December 12, 2018

Susan Lindstrom
P.O. Box 3324
Truckee, CA 96160

RE: Polaris-Pomin Wetlands Complex Project

Dear Susan Lindstrom,

Thank you for your letter dated December 4, 2018 in regard to the above mentioned project. Based on the information provided, the Shingle Springs Band Of Miwok Indians is not aware of any known cultural resources on this site. However, SSR would like to have continued consultation through updates, as the project progresses. This will foster a greater communication between the Tribe and your agency.

SSR would also like to request any and all completed record searches and or surveys that were done in or around the project area up to and including environmental, archaeological and cultural reports. If during the progress of the project new information or human remains are found, we would like to be able to go over our process with you to protect such important and sacred artifacts (especially near rivers and streams).

If such finds are made, please contact Kara Perry, Cultural Outreach Coordinator, at (530) 488-4049 or kperry@ssband.org.
Thank you for providing us with this notice and opportunity to comment.

Sincerely,

Daniel Fonseca
Cultural Resource Director
Tribal Historic Preservation Officer (THPO)
Most Likely Descendant (MLD)

Susan Lindström, Ph.D.

Consulting Archaeologist

P.O. Box 3324

Truckee CA 96160

530-587-7072

530-713-1920 (cell)

susanglindstrom@gmail.com

DATE: December 4, 2018

TO: Grayson Coney, Cultural Director (Don Ryberg, Chairperson)

Tsi Akim Maidu

P.O. Box 510

Browns Valley, CA 95918

530-274-7497; Tsi-akim-maidu@att.net

RE: Polaris-Pomin Wetlands Complex Project

The Tahoe Resource Conservation District (TRCD) proposes to investigate restoration potential and relocated and/or modified recreational alternatives of the Robert Pomin Park, Lake Forest Campground, and associated parking spaces. Wetlands on the approximate 22-acre restoration area containing the park, campground and parking lot would be restored and up to three alternatives (no larger than five acres in size) would be analyzed for their suitability in terms of park relocation. The project would be administered by the TRCD, in coordination with Placer County, the Tahoe City Public Utility District, and the California Department of Parks and Recreation (DPR). The project area is in Township 16 North, Range 17 East, Section 33-32 and Township 15N/Range 17 East/Section 5 M.D.B.M. (see accompanying map).

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Thank you very much.

Susan Lindström

Consulting Archaeologist

Susan Lindström, Ph.D.

Consulting Archaeologist

P.O. Box 3324

Truckee CA 96160

530-587-7072

530-713-1920 (cell)

susanglindstrom@gmail.com

DATE: December 4, 2018

TO: Gene Whitehouse, Chairperson

United Auburn Indian Community of the Auburn Rancheria

10720 Indian Hill Road

Auburn, CA 95603

530-883-2390

RE: Polaris-Pomin Wetlands Complex Project

The Tahoe Resource Conservation District (TRCD) proposes to investigate restoration potential and relocated and/or modified recreational alternatives of the Robert Pomin Park, Lake Forest Campground, and associated parking spaces. Wetlands on the approximate 22-acre restoration area containing the park, campground and parking lot would be restored and up to three alternatives (no larger than five acres in size) would be analyzed for their suitability in terms of park relocation. The project would be administered by the TRCD, in coordination with Placer County, the Tahoe City Public Utility District, and the California Department of Parks and Recreation (DPR). The project area is in Township 16 North, Range 17 East, Section 33-32 and Township 15N/Range 17 East/Section 5 M.D.B.M. (see accompanying map).

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Thank you very much.

Susan Lindström

Consulting Archaeologist

Gmail **Susan Lindstrom <susanglindstrom@gmail.com>**

Polaris-Pomin Wetlands Complex Project

3 messages

Susan Lindstrom <susanglindstrom@gmail.com> Tue, Dec 4, 2018 at 6:12 PM
To: Cherilyn Neider <cneider@auburnrancheria.com>

Hi Cherilyn;
Attached please find information regarding the Polaris project. As always, I welcome your comments.

Susan G. Lindstrom, Ph.D.
Consulting Archaeologist

susanglindstrom@gmail.com
P.O. Box 3324
Truckee, CA 96160
530-587-7072

2 attachments

Polaris NAHC Whitehouse.docx
14K

218093 location v3.pdf
1332K

Cherilyn Neider <cneider@auburnrancheria.com> Mon, Dec 10, 2018 at 12:29 PM
To: Susan Lindstrom <susanglindstrom@gmail.com>

Hi Susan,

Thank you for sharing this information via email. I will circulate for review and get back to you with any comments or concerns.

Best,
Cherilyn

Cherilyn Neider

Tribal Historic Preservation

United Auburn Indian Community

530.883.2394

Susan Lindström, Ph.D.

Consulting Archaeologist

P.O. Box 3324

Truckee CA 96160

530-587-7072

530-587-7072 (cell)

susanglindstrom@gmail.com

DATE: December 4, 2018

TO: Darrel Cruz, THPO, Cultural Resources Department

919 Highway 395 South

Gardnerville, NV 89410

darrel.cruz@washoetribe.us

775-782-0014; 775-546-3421 (cell)

RE: Polaris-Pomin Wetlands Complex Project

The Tahoe Resource Conservation District (TRCD) proposes to investigate restoration potential and relocated and/or modified recreational alternatives of the Robert Pomin Park, Lake Forest Campground, and associated parking spaces. Wetlands on the approximate 22-acre restoration area containing the park, campground and parking lot would be restored and up to three alternatives (no larger than five acres in size) would be analyzed for their suitability in terms of park relocation. The project would be administered by the TRCD, in coordination with Placer County, the Tahoe City Public Utility District, and the California Department of Parks and Recreation (DPR). The project area is in Township 16 North, Range 17 East, Section 33-32 and Township 15N/Range 17 East/Section 5 M.D.B.M. (see accompanying map).

I am following up on the Native American Heritage Commission's recommendation to reach out to other tribes/individuals that may have information about this project. I wish to bring this project to your attention and I invite your opinions, knowledge and sentiments regarding any potential concerns for traditional Native American lands within the project vicinity.

Thank you very much.

Susan Lindström

Consulting Archaeologist

Washoe Tribe of Nevada and California
Tribal Historic Preservation Office
Protect, Preserve and Promote Washoe Heritage and Culture

Susan Lindström, Ph.D.
Consulting Archaeologist
P.O. Box 3324
Truckee CA 96160

December 11, 2018

RE: Polaris-Pomin Wetlands Complex Project

Dear Ms. Lindström,

Thank you for consulting with the Tribal Historic Preservation Office of the Washoe Tribe of Nevada and California on the proposed project and providing supporting documentation.

I am not aware of cultural resources within the project area that may be affected by the proposed project. However based environmental features I suspect the project area would have been an important Washoe habitation area. If there were archaeological resources in the project area, human development has obliterated any evidence of Washoe occupation. Therefore there may still be potential for subsurface archaeology and we recommend all work cease in the event of inadvertent discoveries and the Washoe Tribal Historic Preservation Office be contacted with the findings and continue consultation regarding the findings.

Thank you and please call me if you have any questions at (775) 265-8600.

Respectfully,

Darrel Cruz, Director
Tribal Historic Preservation Office

919 Highway 395, Gardnerville, Nevada 89410
Work (775) 265-8600 • Cell (775) 546-3421

APPENDIX 3

Resume

RESUME

Susan Lindström, Ph.D.
Box 3324, Truckee CA 96160
530-587-7072 (530-713-1920 cell)
susanglindstrom@gmail.com

Education

Ph.D. Archaeology 1992 - University of California Davis
M.A. Anthropology 1978 - University of California Davis
B.A. Anthropology 1972 - University of California Berkeley

Expertise

Cultural Resource Management
Archaeology (prehistoric and historic period)
History and archival records research
Ethnography, ethnohistory, oral history
Native American consultation
Interpretation and public education

Professional Organizations

Register of Professional Archaeologists
(member since 1982)
Society for Historical Archaeology
Society for California Archaeology
Various county and regional historical societies

Lindström's qualifications include archaeological field work and analytical and archival research in the prehistory and history of the western United States including California, the northern and western Great Basin in Nevada and Oregon, and the Cascade Range and the Columbia River Plateau in Oregon and Washington. Her area of expertise is centered in the north-central Sierra where she has over 43 years of experience in historic preservation matters on a local, state and federal level. She has resided in the Tahoe Sierra and accrued full-time professional experience here since 1973.

Heritage Resource Management -- As Forest Archaeologist from 1973 until 1978 for the Tahoe National Forest and "zone" Archaeologist for the El Dorado National Forest and Lake Tahoe Basin Management Unit, and as District Archaeologist for the Bureau of Land Management in 1978 (Burns, Oregon), Lindström initiated and implemented heritage resource programs for the inventory, protection, management and interpretation of prehistoric and historic heritage resources. She conducted training sessions on heritage resource identification and on antiquities legislation.

Contracting and Consulting -- Between 1980 and the present time, as a private consultant, Lindström has conducted and/or supervised fieldwork, data analysis, archival research, and report preparation for hundreds of federal, state, county, and private projects within the north-central Sierra and adjoining regions in California and Nevada. During this time, she has served as an expert witness on historic and prehistoric resources involving California State Supreme Court cases within the Tahoe Sierra.

Teaching -- Lindström instructed introductory level courses in cultural and physical anthropology and archaeology at the University of Nevada, Reno and the University of California, Davis and was appointed as an adjunct professor to the University of Nevada, Reno in 2010.

****Research, Publications and Papers*** -- Academic and heritage management reports pertain to regional prehistory and history, as well as print and video publications for the popular audience (including research findings on the Donner Party, California gold mining, Washoe Indians, and California ethnobotany).

Secretary of Interior Standards: Archaeology and History (Prehistory, Ethnography, Ethnohistory, Ethnobotany, History, Paleoenvironmental Studies)

Lindström's 43 years of full-time professional experience in archaeological research, administration and management at the supervisory level involves the study of resources of the prehistoric, ethnographic, ethnohistoric, and historic period. In the Lake Tahoe Basin and Truckee Basin alone, Lindström has supervised and/or participated in the cumulative survey of nearly 50,000 acres. Her work in the adjoining sierran foothills and valleys approaches an additional 25,000 acres.

Prehistory. Experience in prehistoric archaeology largely pertains to the study of hunter-gatherer groups in the far west. Her surveys and excavations center upon the prehistoric ancestors of the Washoe and Maidu Indians of the north-central Sierra.

Lindström's Ph.D. dissertation focused on Washoe fishing in the Truckee River Drainage Basin. Her M.A. thesis explored high-elevation prehistoric land use in the Truckee-Tahoe Sierra.

During the 1990s she participated in the development of a research design for the Framework for Archaeological Resource Management (FARM), a heritage resource management document used by all north-central sierran forests.

She is presently a reviewer for the *Journal of California Archaeology*.

Ethnography, Ethnohistory, Ethnobotany. Lindström has developed an extensive knowledge of Washoe and Maidu territory and has maintained a good working relationship with these groups beginning in 1973. Since 2000 she has collaborated with prominent Washoe ethnographers such as Warren D'Azevedo and Merideth (Penny) Rucks. Lindström conducted and coordinated ethnographic research to develop a management plan for Cave Rock, a high-profile Washoe Traditional Cultural Property within the Lake Tahoe Basin. She authored a chapter on Native Californian ethnobotany that appears in a standard source book on California vegetation.

History. Experience in historic sites archaeology has focused on resources associated with the study of mining, logging, ranching, transportation, and water management resources. Since 1991 Lindström has conducted excavations at several rural work camps and industrial sites, many involving Chinese wood cutters and colliers. In 1987 and 1990 she field-directed excavations at two Donner Party camps (Murphy's Cabin and Alder Creek) and co-authored a book detailing the archival research, archaeology, architecture, dendrochronology, and zooarchaeology surrounding the tragedy.

Paleoenvironmental Studies. Lindström is a contributor to the 1997 congressionally funded, multi-disciplinary study assessing the environmental health and ecosystem management of the Sierra Nevada (*Sierra Nevada Ecosystem Project* [SNEP]) and the pilot case study focusing on the Lake Tahoe Basin.

She is also a contributor to the *Lake Tahoe Watershed Assessment* study, published in 2000 by the Pacific Southwest Research Station, USDA Forest Service, in collaboration with the Pacific Southwest Region of the USDA Forest Service, the Tahoe Regional Planning Agency, the University of California at Davis, the University of Nevada at Reno, and the Desert Research Institute, Reno, Nevada. The study was mandated as part of former President Clinton's actions to protect Lake Tahoe.

Through a series of snorkel and SCUBA surveys during the 1980s and 1990s in Lake Tahoe and its tributary lakes, Lindström investigated lake level changes and explored submerged remnant forests and prehistoric milling features as paleoenvironmental indicators over the past 6000 years. She presented her findings in scientific journals as a co-author with geologists, hydrologists and limnologists. Her work was also featured in *National Geographic* magazine (March 1992).

Secretary of Interior Standards: Closely Related Fields

Lindström's 43 years of full-time experience also entails research, writing, inventory, evaluation, data recovery, and management in closely related fields pertaining to the "built environment." Her work falls within the historical context of mining, logging, water supply engineering, and ranching landscapes, as well as transportation and communications networks, and town sites. Evaluation and data recovery have been directed to 19th and 20th century structural remains for the following resource types: Chinese/Basque/miner cabins; bake ovens/hearths; sawmills; railroad grades and camps; flumes; ditches; pipelines; dams; reservoirs; water tanks; ice works; ranch complexes; charcoal kilns; mine features; trails/roads/highways; utility lines; and fences.

For her projects involving more complex structural properties such as intact standing buildings, bridges and other architectural features, Lindström has had the opportunity to collaborate and learn from prominent architectural historians, beginning in the early 1980s with the Town of Truckee National Register District nomination process up until the present time.

Lindström also has experience with several historic preservation projects. She authored the heritage resource components for local community plans (from 1989 through 2005) and for county general plans (beginning in 1991). During the 1980s she served as a charter member of the Truckee Historical Preservation Advisory Council. She assisted in the preparation of the Truckee Historic Preservation Plan in 2009, followed by the formal National Register District nomination and subsequent Truckee Streetscape project. She served as a member of the "Placer County Department of Museums Collections Management Task Force" in 2000 and is currently an advisor to the California Department of Parks and Recreation (Sierra District) for their upcoming museum at Donner Memorial State Historic Park.

*available upon request

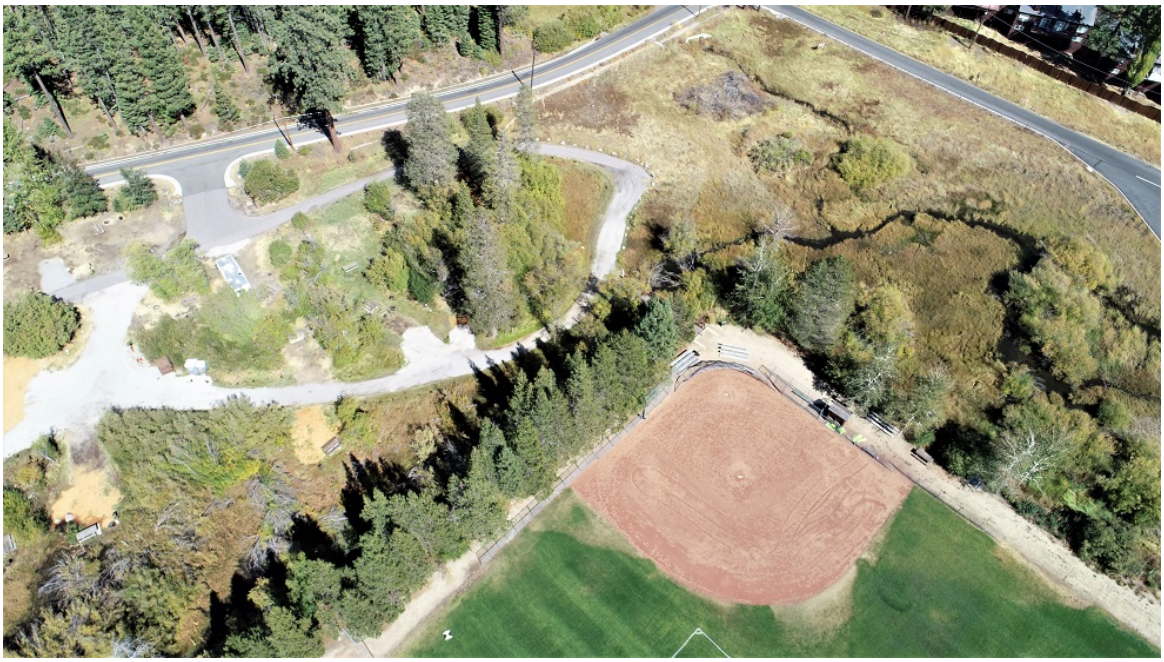
APPENDIX B

Biological Resources and Wetlands Assessment

BIOLOGICAL RESOURCES AND WETLANDS ASSESSMENT
FOR THE

±21-ACRE POLARIS CREEK AND WETLAND STUDY AREA

PLACER COUNTY, CALIFORNIA



Prepared for:
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Prepared by:

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(530) 888-0130

SEPTEMBER 2019
(rev. May 2020)

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BIOLOGICAL RESOURCES and WETLANDS ASSESSMENT for the ±21-ACRE POLARIS CREEK AND WETLAND STUDY AREA

INTRODUCTION

Project Location

At the direction of Balance Hydrologics, Inc., Salix Consulting, Inc (Salix) conducted a Biological and Wetland Resources Assessment on the approximate 21-acre Polaris Creek and wetland study area (study area) located in unincorporated Placer County on the north shore of Lake Tahoe, approximately 1.3 miles east of Tahoe City. The study area is situated in Section 5, Township 15 North and Range 17 East on the Tahoe City, California 7.5-minute USGS topographic quadrangle (Figure 1). The approximate coordinates for the center of study area are 39°10'59.47"N and 120°07'14.82"W. The parcel is located adjacent to State route 28, just south of its intersection with Lake Forest Road (Figure 2).

Project Setting

The study area is comprised primarily of Robert Pomin Park and Lake Forest Campground. The UC Davis Tahoe City Field Station occupies the northwestern study area, adjacent to Highway 28 (Lake Forest Boulevard). The Lake Forest boat ramp parking lot is located in the southeast portion of the study area, and undeveloped lands are located adjacent to the park on the east, west, and southwest. The Star Harbor development is located adjacent to the south and west boundaries, and the U.S. Coast Guard has a facility adjacent to the study area in the southeast. Elevation at the center of the study area in the Pomin Park ballfield is approximately 6,256 feet.

Objectives of Biological Resources Assessment

- Identify and describe the biological communities present in the Study Area.
- Record plant and animal species observed in the Study Area.
- Evaluate and identify sensitive resources and special-status plant and animal species that could be affected by project activities.
- Conduct a wetland assessment that identifies and quantifies potential waters of the U.S within the study area.
- Evaluate wetlands on the site in relationship to the mapped Stream Environment Zone (SEZ).
- Provide conclusions and/or recommendations to assist in the constraints/ opportunities analysis.

Salix consulting, inc.

N

0 1,000 2,000

Feet

Source Maps: USGS Topographic Map
Kings Beach Quad 1:24,000
S31+32 T15N R17E
S5 T16N R17E

Figure 1

SITE AND VICINITY MAP

Polaris Creek

Placer County, CA

Salix consulting, inc.

N

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Feet

Study Area (±21 acres)

Imagery: 10-5-18 Salix Consulting

Figure 2

AERIAL MAP

Polaris Creek

Placer County, CA

METHODS

Literature Review

Salix biologists reviewed recent and historic aerial photographs, USGS maps, engineering exhibits, and site maps for the study area. In addition, the site was flown with a UAV to obtain an orthomosaic aerial photograph. Standard publications were reviewed to provide information on life history, habitat requirements, and distribution of regionally occurring plant and animal species. They include published books, peer-reviewed articles, field guides, and the California Wildlife Habitats Relationships Program. The rare plant survey conducted by Salix for the Lake Forest boat ramp rehabilitation project (Salix 2014) was also reviewed. Publications utilized in this assessment are included in the References section of this document.

Special-Status Species Reports

To assist with the determination of which special-status species could occur within or near the study area Salix biologists queried the California Natural Diversity Data Base (CDFW 2019), the California Native Plant Society Inventory (CNPS 2019), and the USFWS Information for Planning and Consultation (USFWS IPaC 2019) database for reported occurrences of special-status fish, wildlife, and plant species in the region surrounding the study area. The five-quadrangle CNDDB search area included the Tahoe City, Kings Beach, Homewood, Meeks Bay, and Martis Peak USGS quadrangles. In addition, Salix biologists reviewed the California Department of Fish and Wildlife list of Species of Special Concern for the project vicinity. Information on sensitive vegetation and wildlife of the Tahoe Basin contained in the Tahoe Regional Planning Agency (TRPA) *2015 Threshold Evaluation Report*, and other local biological resources reports were also reviewed as part of this assessment.

For the purposes of this report, special-status species are those that fall into one or more of the following categories:

- Listed as endangered or threatened under the federal Endangered Species Act (or candidate species, or formally proposed for listing),
- Listed as endangered or threatened under the California Endangered Species Act (or proposed for listing),
- Designated as rare, protected, or fully protected pursuant to California Fish and Game Code,
- Designated a Species of Special Concern by the California Department of Fish and Wildlife, or
- Designated as Ranks 1, 2, or 3 on lists maintained by the California Native Plant Society.

Noxious Weed Program

Noxious weeds are particularly invasive or detrimental plant species that have been designated by the federal or state government in an effort to control their spread. Salix biologists checked the U.S. Department of Agriculture and the California Food and

Agriculture Code lists of Noxious Weed Species for non-native invasive plants that are designated as noxious weeds (California State-listed Noxious Weeds). These noxious weeds are ranked by the California Department of Food and Agriculture (CDFA) as A, B, C, or which denotes the appropriate action (eradication, containment, etc.) to be taken when such species are detected. The ratings reflect CDFA's view of the statewide importance of the pest plant, the likelihood that eradication or control efforts would be successful, and the present distribution of the pest in the state. These ratings are guidelines that indicate the most appropriate action to take against a pest plant under general circumstances. The rating system is as follows:

- A: an organism of known economic importance subject to state (or commissioner, when acting as a state agent) enforced action involving eradication, quarantine, containment, rejection, or other holding action.
- B: an organism of known economic importance subject to eradication, containment, control, or other holding action at the discretion of the individual county agricultural commissioner, or an organism of known economic importance subject to state-endorser holding action and eradication only when found in a nursery.
- C: an organism subject to no state-enforced action outside of nurseries except to retard spread at the discretion of the commissioner, or an organism subject to no state-enforced action except to provide for pest cleanliness in nurseries.
- Q: details of threat undermined at this time

Field Assessments

A field assessment of the study area was conducted by Jeff Glazner on October 5, October 18, and November 17, 2018, to characterize existing conditions. During the assessment, biological communities were mapped, and the potential for special-status species to inhabit the property was evaluated. A determination of the presence or absence of any potential waters of the U.S. was made as well as any indicators of a stream environment zone (SEZ). Plants and animals observed were documented, and representative ground photographs were taken. Surveys to determine the actual presence or absence of potentially-occurring special-status species were not conducted. A wetland delineation conforming to U.S. Army Corps of Engineers standards was not conducted. Plants observed are listed in Appendix A; animals observed are included in the text below. Plant names are according to The Jepson Manual: Vascular Plants of California, Second Edition (Baldwin et. al. 2012) and updated literature that supersedes the Jepson Manual.

Biological Communities

The study area is located between the northern shore of Lake Tahoe and State Route 28 and consists of six (6) habitat components as listed in Table 1 below and illustrated in Figure 3. Representative site photographs are presented in Figures 4a – 4f.

Table 1
Habitat Components
within the Polaris Creek Study Area

Habitat Component	Approximate Acreage
UPLAND COMMUNITIES	
Coniferous Forest	3.3
Upland/Meadow	3.2
Developed	4.9
Turf/Playfields	2.9
WETLAND COMMUNITIES	
Riparian	4.5
Wet Meadow	1.4
Open Water	0.8
Total	**21.0**

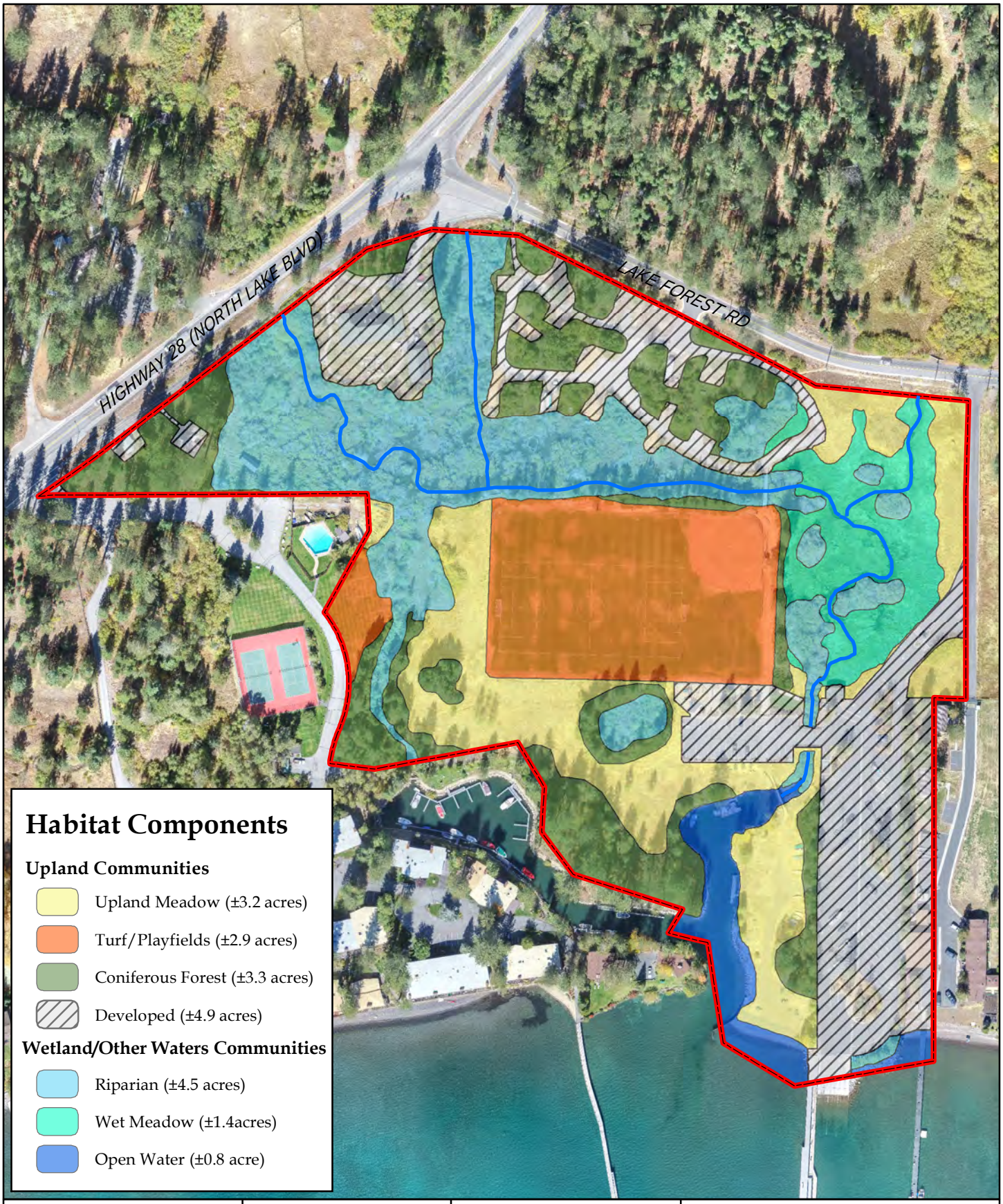
UPLAND COMMUNITIES

Upland Meadow

Upland meadow habitat occupies approximately three acres and is situated mostly west and south of the turf playfield and around the wetlands surrounding Polaris Creek in the northeast. This habitat type is comprised primarily of non-woody species, both native and non-native. Common species include Kentucky bluegrass, second bluegrass (*Poa secunda*), cheatgrass (*Bromus tectorum*), prickly lettuce (*Lactuca seriola*), Baltic rush (*Juncus balticus*), common yarrow, and field pepperweed (*Lepidium latifolium*).

Coniferous Forest

The coniferous forest occupies about 3.3 acres and is distributed in the drier areas throughout the site. It is composed mostly of Jeffrey pine (*Pinus jeffreyi*) and lodgepole pine (*P. contorta*). Other trees growing on the site include white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), and black cottonwood (*Populus trichocarpa*). Shrubs in the forest habitat include Sierra gooseberry (*Ribies roezlii*), Utah serviceberry (*Amelanchier utahensis*), antelope bitterbrush (*Purshia tridentata*), and interior rose (*Rosa woodsii*). Pine duff provides an effective mulch, reducing the amount of herbaceous



Salix consulting, inc.

N

0 100 200

Feet

Study Area (±21 acres)

Imagery: 10-5-18 Salix Consulting

Figure 3

HABITAT MAP

Polaris Creek

Placer County, CA

ground cover. Species observed in the herb layer include squirreltail (*Elymus elymoides*), slender wheatgrass (*Elymus trachycaulus*), Kentucky bluegrass (*Poa pratensis*), common yarrow (*Achillea millefolium*), and mountain mule's ears (*Wyethia mollis*).

Turf/Playfield

A large turf and dirt baseball diamond occupy a little less than three acres in the center of the study area. The turf is well maintained and mowed, and the baseball field is dirt only. In addition, a small turfed area is located adjacent to the Star Harbor development tennis courts (Figures 4b and 4f).

Developed

About five acres of the study area is developed. These areas include pavement and parking areas, including the landscape islands and borders in the parking lots, the roads and structures within the campground, the UC Davis building and adjacent property, and a residence along North Lake Boulevard in the western corner of the study area. A portion of the Lake Forest boat ramp lies within the study area.

WETLAND COMMUNITIES

Wetlands in the study area take on two primary forms, Riparian and Wet Meadow. Wetland features have been modified over recent decades by development and by altered hydrologic inputs throughout the complex. For example, Polaris Creek flows from the north and enters the site through a culvert under Lake Forest Road in the northeast corner of the study area. It has a minor, but well-defined, channel that meanders south into Lake Tahoe. It flows through an open field that is mostly wet meadow. This field has been slightly altered by adjacent developments (soil and debris piles). The large riparian wetland area in the northwest portion receives water through culverts under North Lake Boulevard and presumably from groundwater. In addition, beavers are substantially altering the surface waters with their dams. Beaver lodges are observable in the study area. It is likely that much of the campground was wetland prior to its development, and portions are still wetland.

Riparian

Riparian habitat occupies approximately 4.5 acres of the study area. These areas are primarily shrubby willow/mountain alder (*Salix lasiandra, S. lemmonii, Alnus incana*) but also lodgepole pine (*Pinus contorta*), black cottonwood (*Populus trichocarpa*), and creek dogwood (*Cornus sericea*). The riparian areas are associated largely with the drainage courses but also occur in patches in the wet meadow areas.

Wet Meadow

Approximately 1.4 acres of the study area is wet meadow. These areas are associated with high groundwater and drainages. They support abundant sedges and rushes (*Carex spp., Juncus spp.*) as well as wetland grasses such as meadow barley (*Hordeum brachyantherum*) and showy forbs such as Rydberg's beardtongue (*Penstemon rydbergii*).

Looking west over western portion of study area. Star Harbor on left and UC Davis Tahoe Environmental Research Center on right. *Photo date 10-5-18.*

Looking northeast over northern study area.
Photo date 10-5-18.

Salix consulting, inc.

Figure 4a

AERIAL SITE PHOTOS

Polaris Creek

Placer County, CA

Looking north over campground. *Photo date 10-5-18*.

Looking east over playfields and Polaris Creek.
Photo date 10-5-18.

Salix consulting, inc.

Figure 4b

AERIAL SITE PHOTOS

Polaris Creek

Placer County, CA

Bridge over drainage near Pomin Park entrance.
Photo date 11-17-18.

Looking south from Lake Forest Road over headwall outfall of Polaris Creek. *Photo date 10-5-18.*

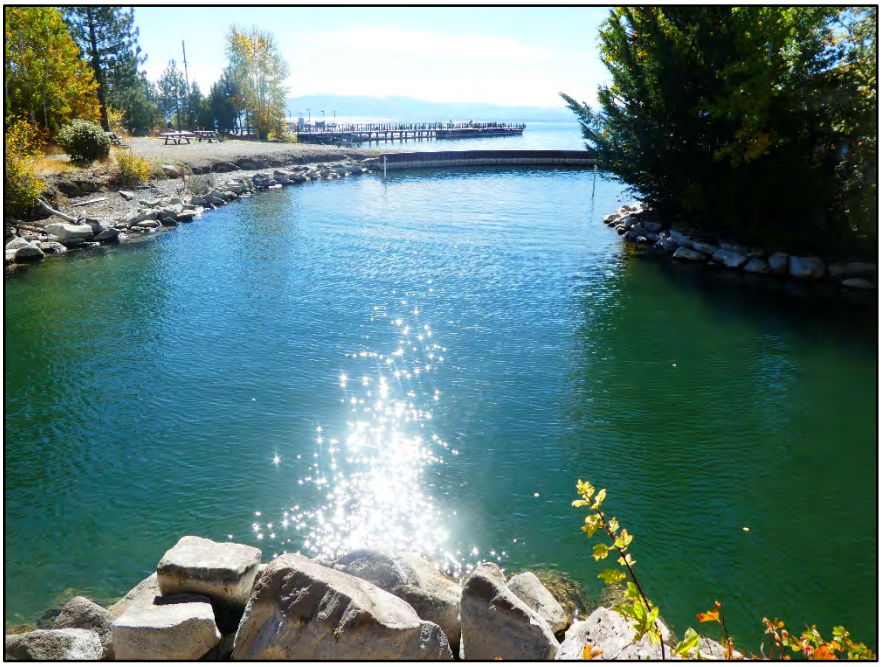
Salix consulting, inc.

Figure 4c

SITE PHOTOS

Polaris Creek

Placer County, CA



Star Harbor inlet channel in south part of study area.
Photo date 10-5-18.

One of gravel roads in campground. *Photo date 10-5-18.*

Salix consulting, inc.

Figure 4d

SITE PHOTOS

Polaris Creek

Placer County, CA

High water encroachment of a campsite.
Photo date 10-5-18.

High water rising due to abundant beaver activity in area.
Photo date 10-22-18.

Salix consulting, inc.

Figure 4e

SITE PHOTOS

Polaris Creek

Placer County, CA

Water/wetlands adjacent to playfields.
Photo date 10-5-18.

Looking south through wetland complex into playfields.
Photo date 11-17-18.

Salix consulting, inc.

Figure 4f

SITE PHOTOS

Polaris Creek

Placer County, CA

Open Water

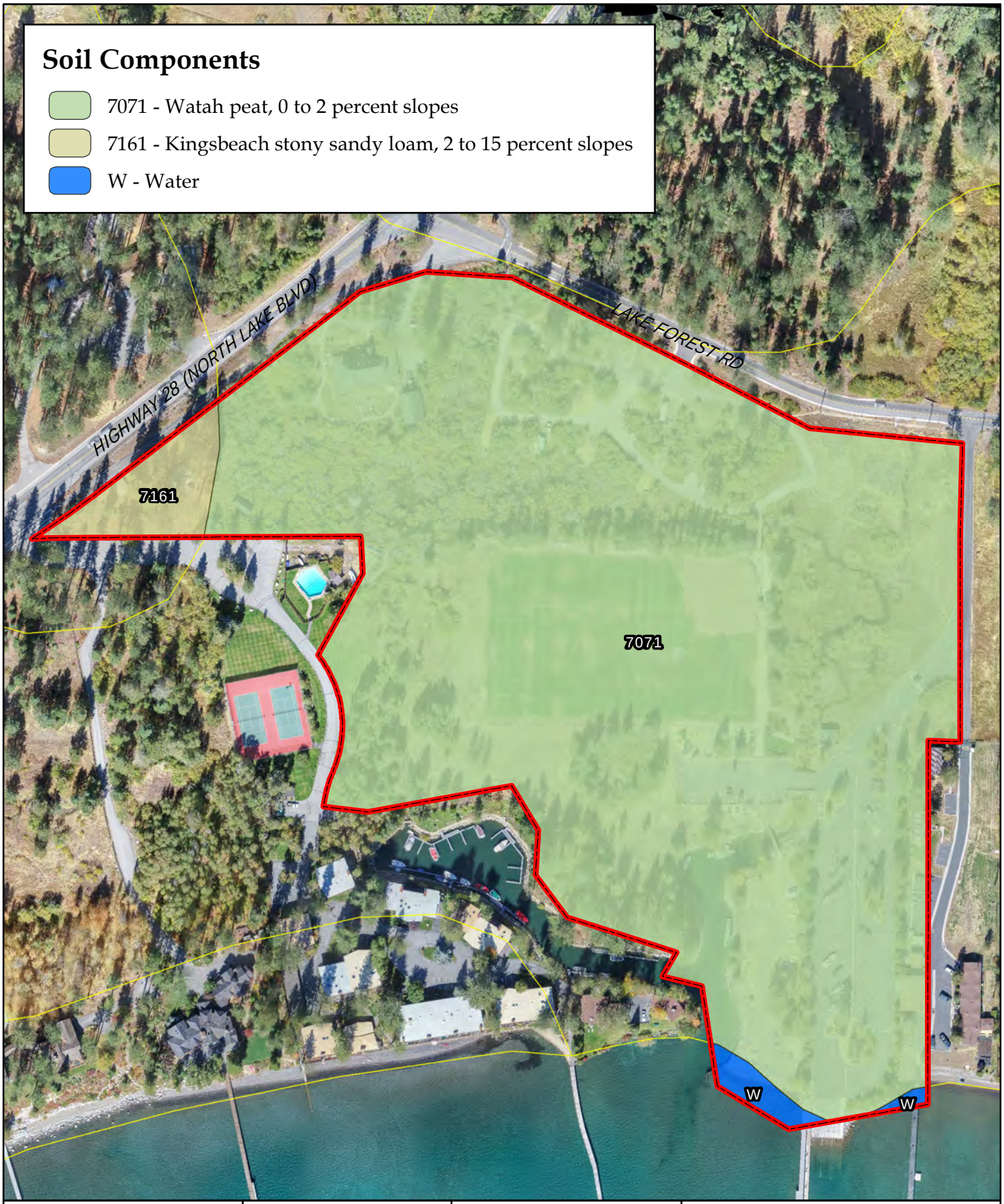
The southeastern edge of the study area is the shore of Lake Tahoe. Also included in this habitat type is the constructed inlet to the Star Harbor marina (Figure 4d).

Soils

Two soil units were identified on the site: Watah peat, 0 to 2 percent slopes and Kingsbeach stony sandy loam, 2 to 15 percent slopes. Water, a miscellaneous area, was also identified on the site. Soils are illustrated in Figure 5.

The majority of the site is composed of the Watah peat soil unit. The Watah component makes up 75 percent of the map unit. Slopes are 0 to 2 percent. This component is on fens, mountains, flood plains, valley flats. The parent material consists of organic material over alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 4 inches during March, April, May. Organic matter content in the surface horizon is about 80 percent. This component is in the R022AX101CA Frigid Anastomosed System ecological site. Nonirrigated land capability classification is 5w. This soil meets hydric criteria.

The Kingsbeach component makes up 80 percent of the map unit. Slopes are 2 to 15 percent. This component is on mountains, alluvial fans, lake terraces. The parent material consists of alluvium and/or colluvium derived from andesite over lacustrine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during May, June. Organic matter content in the surface horizon is about 80 percent. Below this thin organic horizon, the organic matter content is about 2 percent. This component is in the F022AE025CA Pinus Jeffreyi-Abies concolor/Rubus parviflorus-Symphoricarpos mollis ecological site. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.



Salix consulting, inc.

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0 100 200

Feet

Study Area (±21 acres)

Imagery: 10-5-18 Salix Consulting

Figure 5

SOIL COMPONENTS

Polaris Creek

Placer County, CA

Waters of the U.S

The study area is located in a complex hydrologic area that contains a creek (Polaris Creek) and several surface drainages that converge to form a large wetland complex, driven hydrologically by those surface drainages, high groundwater, high beaver activity, and Lake Tahoe. All of these components create a dynamic aquatic environment. The majority of the wetlands support woody hydrophytes and are designated as riparian in this analysis. The non-woody areas are considered wet meadow. These two wetland types are likely jurisdictional waters (waters of the U.S. and waters of the State). Figure 3 shows the existing configuration of upland and wetland communities within the study area.

Stream Environment Zone (SEZ)

The Stream Environment Zone (SEZ) mapping was produced by Spatial Informatics Group (SIG) in 2015 and was primarily based on remote sensing data (such as aerial photography, LIDAR), to-date unverified by ground-truthing. This Basin-wide mapping shows the approximate boundaries of different SEZ types. The map was obtained from the Tahoe Regional Planning Agency (TRPA) and is presented in Figure 6.

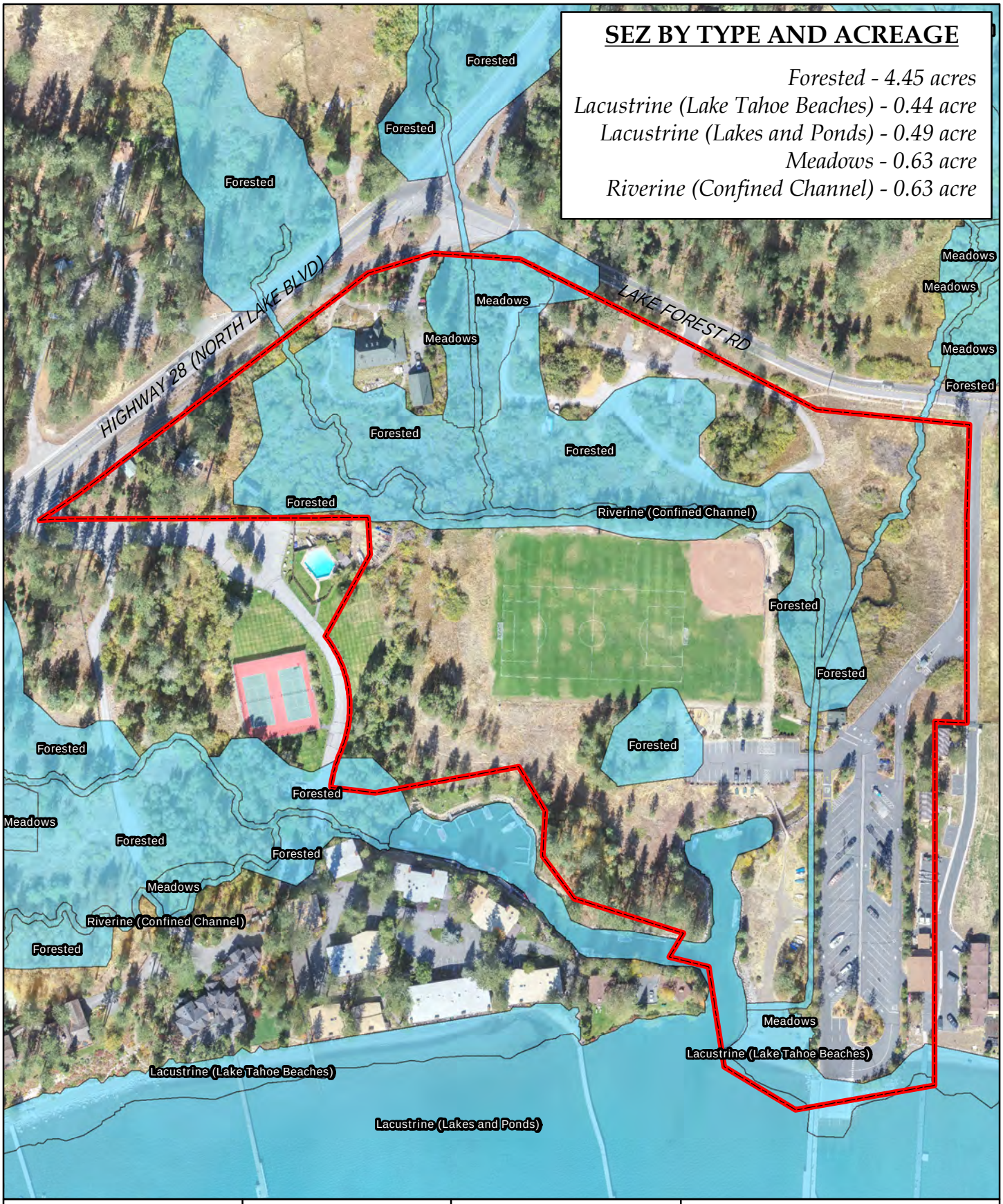
Of the 21 acres included in the study area, 6.64 acres lie within the SEZ, comprised of five (5) types of SEZ as shown in Table 2. Brief descriptions of each zone type (Spatial Informatics, 2015) are provided below the table.

Table 2
SEZ Types Within the Polaris Creek Study Area

SEZ Type	Acreage
Forested	4.45
Lacustrine (Lake Tahoe beaches)	0.44
Lacustrine (Lakes and Ponds)	0.49
Meadows	0.63
Riverine (Confined Channel)	0.63
Total SEZ	**6.64**

Forested

Forested SEZ is dominated by riparian woody vegetation (e.g., aspen, cottonwood, willow, alder and sometimes lodgepole pine) and found in association with the discharge of groundwater to the land surface or sites with saturated overflow with no channel formation. Forested SEZ also can be found adjacent to riverine confined and unconfined channel types. Forested SEZ commonly occurs on sloping land.



Salix consulting, inc.

N

0 100 200

Feet

Study Area (±21 acres)

SEZ Mapping By SIG
Imagery: 10-5-18 Salix Consulting

Figure 6

SEZ MAP

Polaris Creek

Placer County, CA

Lacustrine (Lake Tahoe beaches)

The *Lake Tahoe Beaches* type is defined as grained surfaces adjacent to Lake Tahoe, lacking surface horizon development and owing their existence to current or historic wave or wind action.

Lacustrine (Lakes and Ponds)

Lakes and Ponds are perennially open water bodies, at least 0.01 acre in size. Vegetation within and surrounding this type is sometimes absent, but often comprised of obligate and facultative obligate wetland plant species.

Meadows

Meadows are transitional between terrestrial and aquatic systems where the water table is usually at or near the surface. Meadows are dominated by grasses, sedges and rushes and herbaceous flowering plants and can include a complex of streams, depressional ponds, marshes, bogs, or similar areas.

Riverine (Confined Channel)

Confined Channels and associated riparian areas are open man-made or naturally-created water conduits that have a bed, bank, and ordinary high water mark (a stream, creek, run, tributary, or man-made conveyance ditch). These features periodically or continuously contain moving water or form a connecting link between surface waters.

Wildlife Occurrence and Use

The site provides habitat for a wide variety of animal species due to the presence of high habitat diversity and habitat features including nesting sites, escape and thermal cover, and abundant food sources. Aquatic habitats of the Study Area provide year-round and seasonal sources of water for wildlife of the area, as well as habitat for various aquatic and semi-aquatic species. Forest communities provide for animal cover, roosting and nesting opportunities for songbirds, and shelter for numerous mammals. Snags provide nesting cavities for birds such as owls and woodpeckers. Larger trees provide nesting habitat for raptors such as great horned owl (*Bubo virginianus*) and red-tailed hawk (*Buteo jamaicensis*).

During the field surveys conducted in October and November 2018, a variety of birds were observed in the study area. Because of the elevation of the study area, many species are expected to occur on site only seasonally either for nesting purposes or during migration. Many of the birds observed during the field survey are known to nest in coniferous forest habitats such as those present on site. Bird species observed include mountain chickadee (*Poecile gambeli*), brown creeper (*Certhia Americana*), northern flicker (*Colaptes auratus*), dark-eyed junco (*Junco hyemalis*), white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Setophaga coronata*), pygmy nuthatch (*Sitta pygmaea*), say's phoebe (*Sayornis saya*), white-breasted nuthatch (*Sitta carolinensis*), American robin (*Turdus migratorius*), Brewer's blackbird (*Euphagus cyanocephalus*), steller's jay (*Cyanocitta stelleri*), common raven (*Corvus corax*), and spotted towhee (*Pipilo maculatus*).

Various small mammals were detected throughout the study area including mountain pocket gopher (*Thomomys monticola*), Douglas' squirrel (*Tamiasciurus douglasii*), and golden-mantled ground squirrel (*Spermophilus lateralis*). Tracks, scat, or other sign of mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), and raccoon (*Procyon lotor*) were found in various locations throughout both forested and open communities of the Study Area.

Noxious Weeds

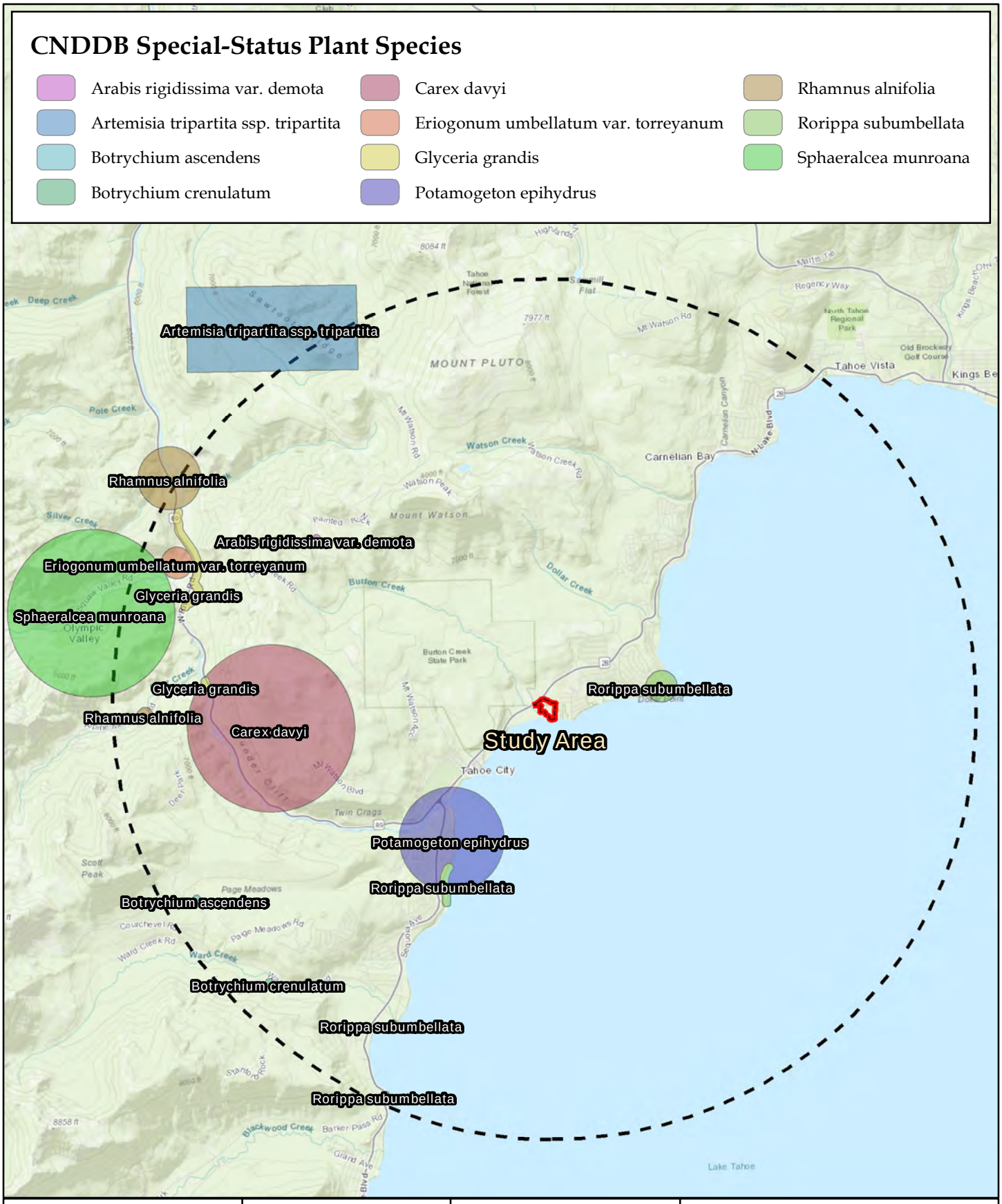
One noxious weed, bull thistle (*Cirsium vulgare)* (moderate IPC rating), was observed in the study area. This species is scattered around the site but there are no areas of infestation. In addition, several non-native species that appear on the Cal-IPC list were observed within the study area during 2018 surveys including: cheatgrass (*Bromus tectorum*) (high rating), and the following species with moderate or limited ratings: Kentucky bluegrass (*Poa pratense*), English plantain (*Plantago lanceolata*), sheep sorrel (*Rumex acetosella*), and curly dock (*Rumex crispus*).

No noxious weed survey was conducted in the open water of Star Harbor, thus the presence/absence or noxious weeds in the harbor was not determined.

Special-Status Species

To determine potentially-occurring special-status species in the region, the standard databases from the USFWS (IPaC 2018), CDFW (CNDDB 2018), and CNPS (2018) were queried and reviewed, as were other sources as noted in the Methodologies/Special Status Species Reports section above. These searches provided a thorough list of regionally occurring species and were used to determine which species had at least some potential to occur within or near the study area.

Appendix B lists potentially-occurring special-status plants, and Appendix C lists special-status animals compiled from our queries as described above. The field survey and the best professional judgment of Salix biologists were used to further refine the tables in Appendices B and C. Additionally, plant species found on the CNPS List 4 are not considered further in the document. Figure 7a shows approximate locations of CNDDB special-status plants within a five-mile radius of the study area.


CNDDB Special-Status Plant Species
Arabis rigidissima var. demota
Artemisia tripartita ssp. tripartita
Botrychium ascendens
Botrychium crenulatum
Carex davyi
Eriogonum umbellatum var. torreyanum
Glyceria grandis
Potamogeton epihydrus
Rhamnus alnifolia
Rorippa subumbellata
Sphaeralcea munroana
Artemisia tripartita ssp. tripartita
Rhamnus alnifolia
Arabis rigidissima var. demota
Eriogonum umbellatum var. torreyanum
Glyceria grandis
Sphaeralcea munroana
Glyceria grandis
Rhamnus alnifolia
Carex davyi
Rorippa subumbellata
Study Area
Potamogeton epihydrus
Rorippa subumbellata
Botrychium ascendens
Botrychium crenulatum
Rorippa subumbellata
Rorippa subumbellata
MOUNT PLUTO
Mount Watson
Tahoe Vista
Carnelian Bay
Tahoe City
Lake Tahoe
Watson Creek
Button Creek
Dollar Creek
Pole Creek
Silver Creek
Deep Creek
Ward Creek
Blackwood Creek
Page Meadows
Burton Creek State Park
Olympic Valley
Mt Watson Rd
Mt Watson Blvd
N Lake Blvd
Regency Way
Twin Crags
Scott Peak
Stanford Rock
Barker Pass Rd
Grand Ave
Courchevel Ave
Sequoia Ave
Carnelian Canyon
North Tahoe Regional Park
Old Brockway Golf Course
Tahoe National Forest
Squaw Valley Ski Flat
Watson Peak
Painted Rock
Under Cliff
8084 ft
7977 ft
8858 ft
Salix consulting, inc.
N
0
4,000
8,000
Feet
5-Mile Radius
Figure 7a
CNDDB OCCURRENCES MAP
Polaris Creek
Placer County, CA

Plants

Of the 22 potentially-occurring plant species identified in the queries described above and listed in Appendix B, 11 species were identified by CNDDB as reported to occur within the surrounding region (generally within or just beyond a 5-mile radius of the study area) (Figure 7a).

Three of the 22 potentially-occurring plants require unique habitats that are not present within the study area. Therefore, there is no potential for them to occur. These include Galena Creek rockcress (*Arabis rigidissima* var. *demota*), Nuttall's ribbon-leaved pondweed (*Potamogeton epihydrus*), and slender-leaved pondweed (*Stuckenia filiformis* subsp. *alpina*), and they have been dismissed from further consideration. Galena Creek rockcress and Nuttall's ribbon-leaved pondweed are reported to occur within a 5-mile radius of the study area (Figure 7a).

Of the 22 species identified in the queries (Appendix B), nineteen (19) plant species were determined to have some potential to occur within the study area (Appendix C). Nine (9) of these species occur within a 5-mile radius of the study area (Figure 7a). Table 3 below provides a summary of those plant species that have been determined to have some potential to occur within the study area based on the analysis of potential to occur presented in Appendix C. Discussions for the identified plant species are provided following Table 3.

Table 3.
Special-Status Plant Species Determined to Have Some Potential to Occur within the Polaris Creek Study Area

Species	Status*			Habitat	Potential for Occurrence Within Study Area**
	Federal	State	CNPS		
Threetip sagebrush *Artemisia tripartita tripartita*	-	-	2B.3	Upper montane coniferous forest (rocky, volcanic openings).	Unlikely. Only marginal habitat occurs within study area.
Nevada daisy *Erigeron eatonii nevadincola*	-	-	2B.3	Great Basin scrub; lower montane coniferous forest; pinyon and juniper woodland (rocky).	Unlikely. Only marginal habitat occurs within study area.
Stebbins' phacelia *Phacelia stebbinsii*	-	-	1B.2	Cismontane woodland; lower montane coniferous forest; meadows and seeps. (primarily rock outcrops and rubble piles).	Unlikely. Only marginal habitat occurs within study area.

Table 3.
Special-Status Plant Species Determined to Have Some Potential to Occur within the Polaris Creek Study Area

Species	Status* Federal	State	CNPS	Habitat	Potential for Occurrence Within Study Area**
Tahoe yellow cress *Rorippa subumbellata*	FC	CE	1B.1	Found only on the shoreline of Lake Tahoe.	Possible. Occurs only on the Lake Tahoe shoreline, some of which is included in the study area. Not found in previous studies at this location.
Davy's sedge *Carex davyi*	-	-	1B.3	Subalpine coniferous forest; upper montane coniferous forest.	Possible. Suitable habitat present within study area.
Woolly-fruited sedge *Carex lasiocarpa*	-	-	2B.3	Bogs and fens; marshes and swamps; [freshwater, lake margins].	Possible. Suitable habitat present within study area.
Mud sedge *Carex limosa*	-	-	2B.2	Bogs and fens [lower montane coniferous forest; upper montane coniferous forest].	Possible. Suitable habitat occurs within study area.
Santa Lucia dwarf rush *Juncus luciensis*	-	-	1B.2	Chaparral; Great Basin Scrub; lower montane coniferous forest; meadows and seeps; vernal pools [mesic locations].	Possible. Suitable habitat present within study area.
Marsh skullcap *Scutellaria galericulata*	-	-	2B.2	Lower montane coniferous forest; meadows (mesic); marshes and swamps.	Possible. Suitable habitat present within study area.
Munroe's desert mallow *Sphaeralcea munroana*	-	-	2B.2	Great Basin scrub.	Unlikely. Only marginal habitat occurs within study area.
Oregon fireweed *Epilobium oreganum*	-	-	1B.2	Bogs and fens; lower montane coniferous forest; [mesic].	Possible. Suitable habitat present within study area.
Uspswept moonwort *Botrychium ascendens*	-	-	2B.3	Lower montane coniferous forest mesic]; meadows and seeps.	Possible. Suitable habitat present within study area.
Scalloped moonwort *Botrychium crenulatum*	-	-	2B.2	Lower montane coniferous forest; bogs and fens; meadows; marshes and swamps (freshwater).	Possible. Suitable habitat present within study area.

Table 3.
Special-Status Plant Species Determined to Have Some Potential to Occur within the Polaris Creek Study Area

Species	Status* Federal	State	CNPS	Habitat	Potential for Occurrence Within Study Area**
Mingan moonwort *Botrychium minganense*	-	-	2B.2	Upper and lower montane coniferous forest (mesic); bogs and fens.	Possible. Suitable habitat present within study area..
Western goblin *Botrychium montanum*	-	-	2B.1	Upper and lower montane coniferous forest (mesic); meadows and seeps.	Possible. Suitable habitat present within study area.
American mannagrass *Glyceria grandis*	-	-	2B.3	Bogs and fens; meadows; marshes and swamps (streambanks and lake margins).	Possible. Suitable habitat present within study area.
Donner Pass buckwheat *Eriogonum umbellatum torreyanum*	-	-	1B.2	Meadows; upper montane coniferous forest; [volcanic, rocky].	Unlikely. Only marginal habitat occurs within study area.
Alder buckthorn *Rhamnus alnifolia*	-	-	2B.2	Upper and lower montane coniferous forests; meadows and seeps; riparian scrub.	Possible. Suitable habitat present within study area.
Plumas ivesia *Ivesia sericoleuca*	-	-	1B.2	Great Basin scrub; lower montane coniferous forest; meadows and seeps; vernal pools; [vernally mesic, usually volcanic].	Possible. Suitable habitat present within study area.

*Status Codes:

CNPS
Rank 1B Rare, Threatened, or Endangered in California
Rank 2 R, T, or E in California, more common elsewhere
1- Seriously threatened in California
2- Fairly threatened in California

**Definitions for the Potential to Occur:
None. No suitable habitat (or nesting habitat) present within the study area.
Unlikely: Minimal or marginal quality habitat in the study area. Disturbance or other activities may restrict or eliminate possibility of species occurring.
Possible. Suitable habitat occurs within the study area. Study area within range of species.
Likely. Study area provides desirable habitat for species and there is a very high probability for its occurrence. Species documented to occur nearby in similar habitat.
Observed: Species was observed within the study area.

Threetip sagebrush (*Artemisia tripartita tripartita)* is a recognized species in CNPS, Calflora, and USDA, however, it is not recognized in Jepson (2012). The species has no state or federal status, but CNPS Ranks this a 2B.3 species. It is a perennial shrub of the Asteraceae family and has been documented in California in the Lake Tahoe region. This species is commonly associated with perennial grass species including Idaho fescue, needle-and-thread grass, Sandberg bluegrass, and Thurber's needlegrass, and common shrubs including big sagebrush, broom snakeweed, green rabbitbrush, and curlleaf mountain-mahogany. Threetip sagebrush is reported to occur within 5 miles of the

study area, but it is unlikely that occurs in the study area because only marginal habitat is present. It was not observed in the study area during the surveys.

Nevada daisy (*Erigeron eatonii var. nevadincola*). No state or federal status. CNPS Rank 2. Nevada daisy is a species of flowering plant in the daisy family. It is endemic to California and Northern Nevada. It grows in open grassland, rocky flats, generally in sagebrush or pinyon/juniper scrub from 4,500 to 9,500 feet elevation. It is a perennial herb with white flower petals. It blooms between June and October. It is not reported to occur within a 5-mile radius of the study area, and it is unlikely for this species to occur in the study area because only marginal habitat is present. It was not observed in the study area during the surveys.

Stebbins' phacelia (*Phacelia stebbinsii*). No state or federal status. CNPS Rank 1B. Stebbins' phacelia is an annual member of the waterleaf family (Hydrophyllaceae). It differs from other annual phacelias by having deeply lobed to compound leaves and a more-or-less rotate corolla with exerted stamens. It has white to pale blue flowers and leaves with two to six lobes which separates it from the more common *P. marcescens*. It grows in moist rocky or gravelly soil at middle elevations in Nevada, Placer, and El Dorado Counties. It blooms in June and July. It is not reported to occur within a 5-mile radius of the study area, and it is unlikely for this species to occur in the study area because only marginal habitat is present. It was not observed in the study area during the surveys.

Tahoe yellow cress (*Rorippa subumbellata*). State Endangered and federal Candidate for listing status. CNPS Rank 1B.1. Tahoe yellow cress is a member of the mustard family. It is a perennial herb, with several, decumbent, branched stems, with crinkled hairs. It is found only on the shores of Lake Tahoe; historically, it was known also from the banks of the Truckee River. Tahoe yellow cress grows in Tahoe's open sandy beaches and dunes, and along the shoreline of lakes, stream mouths and back lagoons, from 5,500 to 7,000 feet elevation. It has yellow flowers that bloom between late May and early September. Tahoe yellow cress is reported to occur along the shores of the lake near the study area. It is possible that Tahoe yellow cress would occur in the study area because the study area includes some suitable areas of the Lake Tahoe shoreline. A previous study at this location (Salix 2014) did not locate this species.

Davy's sedge (*Carex davyi).* No state or federal status. CNPS Rank 1B.3. Carex davyi, a monocot, is a perennial herb that is native to California and is endemic (limited) to California alone. A member of the Cyperaceae family, its habitats include subalpine coniferous forest and upper montane coniferous forest. It blooms from May to August. Carex davyi is reported to occur within the 5-mile radius surrounding the study area, and it is possible that the species occurs in the study area because suitable habitat is present. However, it was not observed during the surveys.

Wooly-fruited (Slender) sedge (*Carex lasiocarpa).* No state or federal status. CNPS Rank 2. From a rhizome, *Carex lasiocarpa* bears erect stems which may exceed a meter in height with very long, very thin leaves. The stem has one to several compact pistillate spikes and at the tip one longer, fluffy staminate spike. The pistillate spike vaguely

resembles a tiny purplish or brownish ear of corn, with several ovaries which each form a fruit. It occurs in very wet locations, often in standing water. *Carex lasiocarpa* is not reported to occur within 5 miles of the study area. However, it is possible that slender sedge occurs because suitable habitat is present within the study area. The species was not observed during the surveys.

Mud sedge (*Carex limosa*). No federal or state status. CNPS Rank 2B.2. Carex limosa is a perennial rhizomatous herb of the Cyperaceae family, native to California. It occurs in bogs and fens of upper and lower montane coniferous forest. It is an aquatic or shore plant most often found in peat bogs in mountains. *Carex limosa* has a large rhizome and hairy roots. It produces a stem which is generally just under half a meter in height and has a few basal leaves which are long and threadlike. The tip of the stem is often occupied by a staminate spikelet, and below this hang one or more nodding pistillate spikelets. It blooms June through August. Mud sedge is not reported to occur within 5 miles of the study area. However, it is possible that slender sedge occurs because suitable habitat is present within the study area. It was not observed during the surveys.

Santa Lucia dwarf rush *(Juncus luciensis).* No state or federal status. CNPS Rank 1B.2. *Juncus luciensis* is an annual herb growing just a few centimeters tall, yellowish-green in color. The leaves are up to 1.5 centimeters long. The inflorescence contains one or two flowers with yellow-green tepals. It occurs in mesic locations (meadows, seeps, vernal pools) in chaparral, Great Basin scrub, and lower montane coniferous forest and blooms April to July. *Juncus luciensis* is not reported to occur within 5 miles of the study area. However, it is possible that slender sedge occurs because suitable habitat is present within the study area. The species was not observed during the surveys.

Marsh skullcap (*Scutellaria galericulata*). No state or federal status. CNPS Rank 2. Marsh skullcpa is a perennial member of the mint family (Lamiaceae). It grows in montane meadows, marshes, and swamps, and blooms between June and September. The species is not reported to occur within 5 miles of the study area. However, it is possible that marsh skullcap occurs in the study area because suitable habitat is present. It was not observed during the surveys.

Munro's desert mallow *(Sphaeralcea munroana).* No state or federal status. CNPS Rank 2.2. Munro's desert mallow is a species of flowering plant in the mallow family. It is native to the western United States, where it can be found in the Great Basin and surrounding regions. It grows in sagebrush, desert flats, and mountain slopes. This perennial herb produces erect stems up to about 80 centimeters tall from a thick root system. It is woolly and gray-green in color. The alternately arranged leaves have triangular blades up to 6 centimeters long, usually edged with large lobes and a toothed margin. Flowers occur in clusters on a raceme-like inflorescence. The flower has five apricot to red-orange petals each just over a centimeter long. It blooms from May to June. The species is reported to occur within the 5-mile radius surrounding the study area. However, it is unlikely that Munro's desert mallow occurs in the study area because only marginal habitat is present. It was not observed during the surveys.

Oregon fireweed *(Epilobum oreganum).* No state or federal status. CNPS Rank 1B.2. Oregon fireweed is a perennial member of the Onagraceae (evening primrose) family that grows in bogs and fens of lower montane coniferous forest. It grows up to a meter in height with thin, hairless stems. The red-veined leaves are oval to lance-shaped and up to 9 centimeters long. The inflorescence bears flowers with pink petals just over a centimeter long and a protruding pistil. Blooms between June and September. The species is not reported to occur within 5 miles of the study area. However, it is possible that it occurs in the study area because suitable habitat is present. This species was not observed during the survey.

Upswept moonwort (*Botrychium ascendens).* No state or federal status. CNPS Rank 2B.3. A perennial rhizomatous herb of the Ophioglossaceae family. It is a very small plant growing from an underground caudex and sending one yellow-green leaf above the surface of the ground. The leaf is up to 6 centimeters tall and is divided into a sterile and a fertile part. It occurs in mesic areas of lower montane coniferous forest (meadows and seeps) and blooms in July and August. *Botrychium ascendens* is reported to occur within 5 miles of the study area, and it is possible that it occurs within the study area because suitable habitat is present. This species was not observed during the survey.

Scalloped moonwort (*Botrychium crenulatum).* No state or federal status. CNPS Rank 2.2. Scalloped moonwort is a very small plant growing from an underground caudex and sending one thin, shiny, yellow-green leaf above the surface of the ground. The leaf is up to about 6 centimeters tall and is divided into a sterile and a fertile part. The sterile part of the leaf has veined, fan-shaped leaflets with wrinkly edges. The fertile part of the leaf is very different in shape, with tiny grapelike clusters of sporangia by which it reproduces. It grows in mountain seeps and along stream margins. *Botrychium crenulatum* is reported to occur within 5 miles of the study area, and it is possible that it occurs within the study area because suitable habitat is present. This species was not observed during the survey.

Mingan moonwort (*Botrychium minganense).* No state or federal status. CNPS Rank 2.2. Mingan moonwort is a very small plant growing from an underground caudex and sending one thin leaf above the surface of the ground. The leaf is up to 10 centimeters tall and is divided into a sterile and a fertile part. The sterile part of the leaf has fan-shaped or spoon-shaped leaflets. The fertile part of the leaf is very different in shape, with grapelike clusters of sporangia by which it reproduces. It grows in meadows, around seeps and along streams in open forests. *Botrychium minganense* is not reported to occur within 5 miles of the study area. However, it is possible that it occurs within the study area because suitable habitat is present. This species was not observed during the survey.

Western goblin (*Botrychium montanum***).** No state or federal status. CNPS Rank 2.1. *Botrychium montanum* is a species of fern in the family Ophioglossaceae. It is native to western North America from British Columbia to northern California to Montana, where it grows in the dark understory of coniferous forests and other moist wooded areas. This is very small plant growing from an underground caudex and sending one thin gray-green leaf above the surface of the ground. The leaf is less than 8 centimeters tall and is

divided into a sterile and a fertile part. The sterile part of the leaf has irregularly shaped angled leaflets. The fertile part of the leaf has grapelike clusters of sporangia, by which the plant reproduces. *Botrychium montanum* is not reported to occur within 5 miles of the study area. However, it is possible that it occurs within the study area because suitable habitat is present. This species was not observed during the survey.

American mannagrass (*Glyceria grandis*). No state and federal status. CNPS Rank 2. It is native to Canada and the United States, where it is widespread in distribution. It is most commonly found in wet areas such as riverbanks and ponds. This is a rhizomatous perennial grass bearing thin stems which approach two meters in maximum height. The sturdy leaves each have a prominent central vein. The tops of the stems are occupied with spreading, multi-branched inflorescences bearing many small, oval-shaped spikelets. It blooms between June and August. American mannagrass is reported to occur within a five-mile radius of the study area, and it is possible that it occurs there because suitable habitat is present. It was not observed in the study area during the survey.

Donner Pass buckwheat (*Eriogonum umbellatum* var. *torreyanum*). No state or federal status. CNPS Rank 1B. Donner Pass buckwheat is a low semi-shrub in the buckwheat family (Polygonaceae). It differs from other similar members of the genus by its bright yellow flowers, compound inflorescence, and glabrous leaf surfaces. Donner Pass buckwheat grows in rocky volcanic soil in montane forest openings in the northern Sierra Nevada. It blooms from July to September. It is reported to occur within a five-mile radius of the study area, but it is unlikely to occur because only marginal habitat is present. Donner Pass Buckwheat was not observed in the study area during the survey.

Alder buckthorn (*Rhamnus alnifolia).* No state or federal status. CNPS Rank 2.2. *Rhamnus alnifolia* is a spreading shrub approaching two meters in maximum height, its thin branches bearing deciduous leaves. The thin, deeply veined leaves have oval blades up to 10 centimeters long, pointed at the tip and lightly toothed along the edges. The inflorescence is a solitary flower or umbel of up to three flowers occurring in leaf axils. The tiny flowers are just a few millimeters wide and lack petals. Female flowers drupes just under a centimeter wide, each containing three seeds. The drupes darken to black when ripe. It is reported to occur within a five-mile radius of the study area, and it is possible that it occurs within the study area due to the presence of suitable habitat. It was not observed during the surveys.

Plumas ivesia (*Ivesia sericoleuca*). No state or federal status. CNPS Rank 1B.2. Plumas ivesia is a perennial member of the rose family (Rosaceae). It has a nearly cylindrical leaf with many leaflets and numerous white flowers. It grows in dry to moist meadows in Great Basin scrub and coniferous forests. It occurs in the northern Sierra Nevada to the Modoc Plateau, and blooms from May to September. Plumas ivesia is not reported to occur within a five-mile radius of the study area, but it is possible that it occurs within the study area due to the presence of suitable habitat. It was not observed during the surveys.

Animals

Of the 13 animal species identified in the queries described above and listed as potentially-occurring in Appendix C, nine (9) species were identified as occurring within the surrounding region (within or just beyond a 5-mile radius of the study area) (Figure 7b). Table 4 below provides a summary of those animal species that have been determined to have some potential to occur within the study area based on the analysis of potential to occur presented in Appendix D. Discussions for the identified animal species are provided following Table 4.

Table 4.
Special-Status Animal Species Determined to Have Some Potential to Occur within the Polaris Creek Study Area

Species	Status* Federal	Status* State	Habitat	Potential for Occurrence**
Fish				
Lahontan cutthroat trout *Oncorhynchus clarkia henshawi*	FT	-	Endemic to streams of Lahontan Basin of northern Nevada, eastern California, and southern Oregon.	Unlikely. Recently being re-introduced to Lake Tahoe. Most self-sustaining populations are located in isolated headwater streams and are the result of reintroduction efforts.
Amphibians				
Sierra Nevada yellow-legged frog *Rana sierrae*	FC	CSC/CCE	Streams, lakes, and ponds in montane habitats. Usually found very close to water. Prefers open stream and lake edges with gentle slopes.	Possible. Suitable habitat occurs within study area.
Northern leopard frog *Lithobates pipiens*	-	CSC	Known from a variety of aquatic habitats. Endemic populations potentially occur in Truckee River drainage. Generally prefers abundant water with aquatic vegetation.	Unlikely. Suitable habitat within study area, but species is uncommon in the region.
Southern long-toed salamander *Ambystoma macrodactylum sigillatum*	-	CSC	Inhabits alpine meadows, high mountain ponds and lakes.	Possible. Suitable habitat occurs within study area.
Birds				
Bald eagle *Haliaeetus leucocephalus*	*	CE	Lake margins and rivers. Nests in large old-growth trees.	Unlikely. Only very marginal nesting habitat present within study area.
Northern goshawk *Accipiter gentilis*	-	CSC	Mature & old-growth stands of conifer and deciduous forests.	Possible. Suitable nesting habitat in coniferous forest.

Table 4.
Special-Status Animal Species Determined to Have Some Potential to Occur within the Polaris Creek Study Area

Species	Status* Federal	Status* State	Habitat	Potential for Occurrence**
Yellow warbler *Dendroica petechia brewsteri*	-	CSC	Breeds in riparian deciduous habitats or open conifer forest with shrub cover.	Likely. Suitable nesting habitat present in willow scrub in the study area.
Willow flycatcher *Empidonax traillii*	-	CE	Breeds in extensive willow thickets on edge of wet meadows, ponds, or streams.	Possible. Nesting habitat present within study area
Mammals				
Sierra Nevada snowshoe hare *Lepus americanus tahoensis*	-	CSC	Montane riparian habitats, with dense thickets of young trees and shrubs.	Possible. Suitable habitat occurs within study area.
Western white-tailed jackrabbit *Lepus townsendii townsendii*	-	CSC	Open areas in a variety of higher elevation habitats.	Unlikely. Only marginal habitat occurs within study area.
Sierra Nevada Mountain Beaver *Aplodontia rufa californica*	-	CSC	Aquatic habitats with adjacent shrubs and deciduous trees.	Possible. Suitable habitat occurs within study area.
California wolverine *Gulo gulo*	FC	CT	Open terrain habitats in alpine areas. Areas of minimal human disturbance.	Unlikely. Uncommon in the region and avoids areas with human habitation.
Pacific fisher *Martes pennanti (pacifica) DPS*	FC	CSC	Intermediate to large-tree conifer forests and riparian woodlands.	Unlikely. Only marginal habitat and high-use human habitation areas within study area.

*Status Codes:

Federal

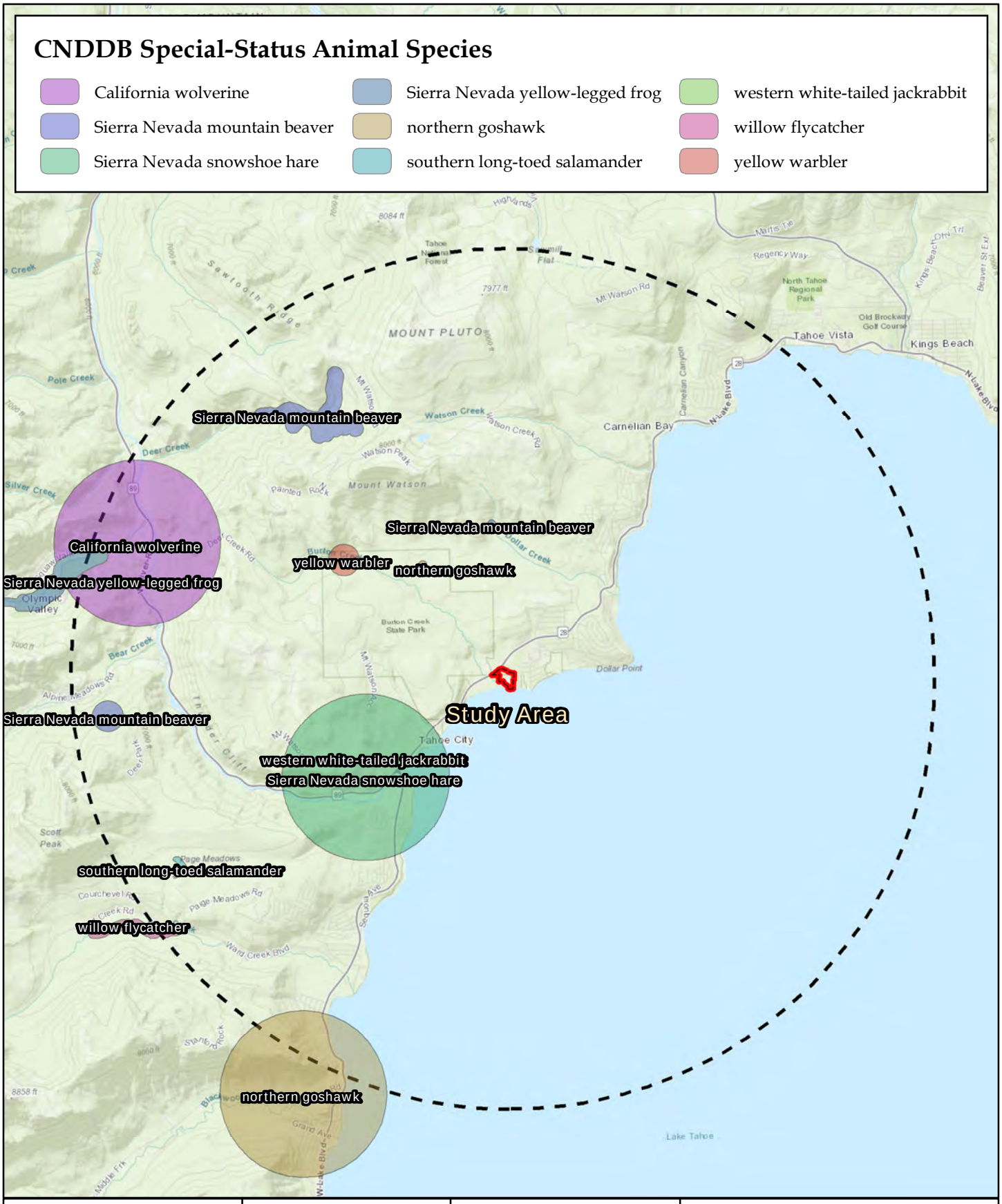
FT Federal Threatened
FC Federal Candidate Species
* Delisted

State

CE California Endangered
CT California Threatened
CSC California Species of Concern
CFP California Fully Protected
CCE California Candidate – Endangered

**Definitions for the Potential to Occur:

- **None.** Habitat does not occur.
- **Unlikely.** Some habitat may occur, but disturbance or other activities may restrict or eliminate the possibility of the species occurring. Habitat may be very marginal, or the Study Area may be outside the range of the species.
- **Possible.** Marginal to suitable habitat occurs, and the Study Area occurs within the range of the species.
- **Likely.** Good habitat occurs, but the species was not observed during surveys.
- **Occurs:** Species was observed during surveys.


CNDDB Special-Status Animal Species
California wolverine
Sierra Nevada mountain beaver
Sierra Nevada snowshoe hare
Sierra Nevada yellow-legged frog
northern goshawk
southern long-toed salamander
western white-tailed jackrabbit
willow flycatcher
yellow warbler
Sierra Nevada mountain beaver
California wolverine
Sierra Nevada yellow-legged frog
yellow warbler
northern goshawk
Sierra Nevada mountain beaver
Study Area
western white-tailed jackrabbit
Sierra Nevada snowshoe hare
southern long-toed salamander
willow flycatcher
northern goshawk
MOUNT PLUTO
Tahoe Vista
Kings Beach
Carnelian Bay
Tahoe City
Dollar Point
Lake Tahoe
Watson Creek
Deer Creek
Bear Creek
Pole Creek
Silver Creek
Mount Watson
Scott Peak
Sawtooth Ridge
Olympic Valley
Burton Creek State Park
North Tahoe Regional Park
Old Brockway Golf Course
Regency Way
Mt Watson Rd
Watson Creek Rd
Dollar Creek
Alpine Meadows Rd
Deer Park
Courchevel Rd
Page Meadows Rd
Ward Creek Blvd
Grand Ave
Stanford Rock
Middle Fk
Cornelian Canyon
N Lake Blvd
Beaver St Ext
Kings Beach Otw Trl
Marlis Tie
Sawmill Flat
Tahoe National Forest
8084 ft
7977 ft
8858 ft
N
0
4,000
8,000
Feet
5-Mile Radius
Figure 7b
CNDDB OCCURRENCES MAP
Polaris Creek
Placer County, CA
Salix consulting, inc.

Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi*) is a federally-listed threatened species and is found in a wide variety of cold-water habitats throughout the Lahontan Basin of northern Nevada, eastern California, and southern Oregon. It generally occurs in cold, clear flowing water with adjacent well-vegetated and stable stream banks (USFWS 2009). A segment of the population in the Truckee River basin also occurs in large lakes. Lahontan cutthroat trout (LCT) spawn in streams, between February and July, depending on local water conditions.

LCT were once abundant in the Truckee River basin, but populations have been significantly reduced due to a variety of factors including habitat loss, development, water diversions, poor water quality, and competition with introduced fish species. In 1960, LCT populations in the Truckee River basin were limited to Pole Creek, Pyramid Lake, Independence Lake, and its tributary Independence Creek. Stream populations in a variety of streams and rivers in the Truckee River basin were later started through stocking in the 1980's and early 1990's. Currently, seven stream populations occupy about 8 miles of habitat comprising 2.2 percent of the historic stream distribution (Coffin and Cowan 1995).

The CNDDB lists no documented occurrences of LCT in the vicinity (within a five-mile radius) of the study area (CNDDB 2018). While there have been efforts recently to reintroduce LCT into Lake Tahoe (USFWS 2013), it has been determined that most self-sustaining populations are located in isolated headwater streams. It is unlikley that LCT occur within the study area, and the species was not observed during surveys.

Sierra Nevada Yellow-legged Frog (*Rana sierrae*) is federally- listed as endangered and California-listed as threatened and a Species of Concern. It occurs primarily at higher elevations of the Sierra Nevada from Plumas County to southern Tulare County (Zeiner et al. 1998). In the Sierra Nevada this species is associated with streams, lakes and ponds in montane riparian, lodgepole pine, subalpine conifer, and wet meadow habitat types at elevations ranging from 4,500 ft to 12,000 ft. This species is generally not found more than 3.3 feet from water. Adults are typically found sitting on rocks along shorelines where there is minimal to no vegetation. The Sierra Nevada yellow-legged frog (SNYLF) feeds primarily on aquatic and terrestrial invertebrates but favors terrestrial insects. Tadpoles graze on algae and diatoms along rocky bottoms in shallow waters. Breeding and egg-laying at higher elevations usually occurs from June to August depending on local conditions. Clusters of 200 to 300 eggs are deposited in shallow water and attached to gravel or submerged rocks. Tadpoles may require up to two over-wintering periods to complete metamorphosis. Adults are commonly preyed upon by garter snakes and introduced trout.

SNYF is reported to occur within 5 miles of the study area (CNDDB 2018), to the west in the Olympic Valley area. Suitable habitat for SNYLF is present within the Study Area thus it is possible that the species occurs there. The species was not observed during the surveys. There is no critical habitat for the species at this location.

Northern leopard frog (*Lithobates pipiens*) is state-listed as a Species of Concern and is uncommon and localized in California; many populations appear to be introduced. The preferred elevation range extends from sea level to 7,000 feet (Zeiner et al., 1988). The northern leopard frog is a highly aquatic species typically found in springs, slow

flowing streams, marshes, bogs, ponds, canals, and reservoirs, usually in permanent and semi-permanent water in many habitat types (Stebbins 1985). Northern leopard frogs require permanent aquatic habitat to breed, feed, and overwinter. In California, northern leopard frogs breed and lay eggs from December through June depending on local water conditions. Females deposit clusters of eggs which attach to vegetation in shallow water. Eggs hatch within three weeks and tadpoles metamorphose in two to four months.

There are no reported occurrences of northern leopard frog within a five-mile radius of the study area, and while suitable habitat is located within the study area, the species is so uncommon in the region that it is unlikely that it occurs there. The species was not observed during surveys.

Southern long-toed salamander *(Ambystoma macrodactylum sigillatum)* is state-listed as a Species of Concern and ranges from southwestern Oregon into the Sierra Nevada as far south as Carson Pass in California. Preferred habitats include ponderosa pine, montane hardwood-conifer, mixed conifer, montane riparian, red fir and wet meadows. Found from near sea level to 9180 feet. Adults are subterranean during most of the year, utilizing mammal burrows, rock fissures, and occasionally human-made structures. During breeding migrations, they may be found under surface objects such as rocks or logs near the breeding pond. Terrestrial juveniles may spend the entire first summer of life in mammal burrows or under surface objects in the immediate vicinity of the breeding pond. Aquatic larvae prefer shallow water, less than 12 inches in depth, and utilize clumps of vegetation or other bottom debris as cover. Southern long-toed salamander breeds primarily in temporary ponds formed by winter and spring rains and snowmelt. Some populations, especially those occurring at high elevations, require permanent ponds because of slow developmental rates of larvae. In montane situations, salamanders emerge and migrate to breeding ponds as soon as springtime temperatures are warm enough to reduce snow cover and open ponds.

Southern long-toed salamander is reported to occur within a five-mile radius of the study area, to the southwest. It is possible that southern long-toed salamander occurs within the study area because suitable habitat occurs there**.** The species was not observed during surveys.

Bald Eagle *(Haliaeetus leucocephalus)* is state-listed as endangered and is a fully-protected species in California, where it is a permanent resident and uncommon winter migrant throughout the state. Breeding of this species is restricted to higher elevations in the northern portion of the state. Bald eagles require large bodies of water, or free-flowing rivers with nearby perches, including snags, large-limbed tall trees, or rocks near water. Nests are constructed in a large, old-growth, or dominant live tree with open branches, located near water. This species often chooses the largest tree in a stand for nesting. Nest consists of a stick platform constructed 50 to 200 feet above the ground, usually just below the tree crown. Breeding occurs from February through July, with peak activity from March to June. Incubation occurs for 34 to 36 days. Breeding then occur when birds are 4 to 5 years in age. Diet of bald eagles consists of live or dead fish, water birds, and mammals.

There are no reported occurrences of bald eagle within a five-mile radius of the study area, and it is unlikely to occur because only very marginal nesting habitat is present within the study area. No bald eagles were observed during surveys.

Northern goshawk (*Accipiter gentilis*) occurs in dense, mature conifer and deciduous forest habitats interspersed with meadows or other openings. It typically breeds in mature old-growth stands of conifer and deciduous habitats, at mid to high elevations. Nesting habitat generally includes north-facing slopes located near water. Nests are usually located in the fork of a large, horizontal limb close to the trunk, approximately 19-82 feet above the ground. This species often uses old nests and will maintain alternate sites. Breeding generally begins in mid-June, with eggs being incubated approximately 36 to 41 days. Young usually fledge at about 45 following hatching and are typically independent by 70 days.

Northern goshawk is reported to occur within a five-mile radius of the study area, to the south. It is possible that this species occurs within the study area because suitable nesting habitat occurs in the site's mixed coniferous forest**.** The species was not observed during surveys.

Yellow warbler (*Dendoica petechia*) is an uncommon to common, summer resident in the northern Sierra Nevada. It primarily breeds in riparian woodlands up to 8000 feet, but is also known to breed in montane chaparral, open ponderosa pine and mixed conifer habitats with substantial amounts of shrub cover. During migration, this species is found in a variety of forest and woodland habitats. Nests consist of an open cup placed approximately 2 to 16 feet above the ground in a deciduous tree or shrub. Breeding generally takes place from mid-April to early-August with peak activity occurring in June. Incubation is approximately 11 days. Young fledge at about 9 to 12 days following hatching. Young yellow warblers breed the following year after hatching.

Yellow warbler is reported to occur within a five-mile radius of the study area, to the northwest of the study area. It is likely that yellow warbler occurs within the study area due to the presence of suitable nesting habitat in the willow scrub. However, the species was not observed during surveys.

Willow Flycatcher *(Empidonax trailii),* a state-listed endangered species, is a rare to locally uncommon summer resident in the Sierra Nevada. Willow flycatcher breeds from Tulare County north, along the western front of the Sierra Nevada and Cascade mountain ranges, extending to the coast in northern California. This species resides in wet meadows and montane riparian habitats, up to 8,000 feet in elevation, and most often occurs in broad, open river valleys or large mountain meadows with large areas of shrubby willows (Zeiner et al. 1990). Preferred nesting habitat for willow flycatcher consists of extensive thickets of low, dense willows located along the edges of wet meadows, ponds, or backwater areas. While territories as small as one acre in size have been documented in riparian patches, suitable nesting habitat is generally greater than 10 acres in size. The nest consists of an open cup constructed in an upright fork of a willow or other shrub, approximately 1.5 to 10 feet above the ground. Individual birds arrive from Central and South American wintering grounds in May through June. Peak

egg-laying of willow flycatcher is during June. Incubation occurs for 12 to 13 days, and young fledge approximately 13 to 14 days after hatching.

The CNDDB (2018) documents occurrences of willow flycatcher to the southwest of the study area, within a five-mile radius of the site. It is possible that willow flycatcher occurs within the study area due to the presence of suitable nesting habitat. The species was not observed during surveys.

Sierra Nevada Snowshoe hare *(Lepus americanus tahoensis)* is an uncommon resident at upper elevations of the Sierra Nevada. This subspecies of snowshoe hare is primarily found in montane riparian habitats with thickets of alders and willows, and in stands of young conifers mixed with chaparral. It prefers the younger stages of a variety of coniferous forests habitats, primarily occurring along the edges, adjacent to meadows. Individuals seek cover in dense tree or shrub thickets, where they create a shallow bowl-like depression. Breeding takes place from mid-February to June or July, with a gestation period of 35 to 37 days. Two to three litters are generally produced. Diet consists of grasses, forbs, sedges, and low shrubs during the summer. In winter, they eat the needles and bark of young conifers, and leaves and twigs of willow and alder (Zeiner et al. 1990).

Sierra Nevada Snowshoe hare is reported to occur fairly close to the study area, to the southwest. It is possible that the species occurs within the study area due to presence of suitable habitat, but it was not observed during surveys.

Western White-tailed Jackrabbit *(Lepus townsendii)* is an uncommon to rare year-round resident of the crest and upper eastern slope of the Sierra Nevada and Cascade Range from the Oregon border south to Tulare and Inyo counties. Once widespread through its range, populations of the western white-tailed jackrabbit have become significantly fragmented. This primarily nocturnal species prefers open areas with scattered shrubs, such as in sagebrush, subalpine conifer, juniper, and perennial grassland habitats. It also occurs in wet meadows and early stages of conifer habitats. Seasonal movement from higher to lower elevations during winter months is common with this species. Like other hares, white-tailed jackrabbit takes cover in a shallow depression in dense underbrush. Breeding takes places from February to July, with gestation occurring for 30 to 42 days. Soon after birth, the young forage for themselves and subsequently become independent at about 3 to 4 weeks. During the spring through fall, the diet consists of grasses and other herbaceous plants. In winter, the diet includes buds, bark, and young twigs (Zeiner et al., 1990).

Western white-tailed jackrabbit is reported to occur fairly close to the study area, to the southwest. But based on the rarity of this species in the region and limited amount of suitable habitat available, occurrence of western white-tailed hare within or near the Study Area is considered unlikely. It was not observed during surveys.

Sierra Nevada Mountain Beaver (*Aplodontia rufa californica*) (not to be confused with the more commonly occurring North American beaver (*Castor canadensis*) occurs throughout the Sierra Nevada in montane riparian habitats, consisting of dense riparian-deciduous vegetation. This mostly nocturnal species also frequents forested areas with a dense understory near water. Cool, moist microclimates are required, along with deep, friable soils for burrowing. Burrows are excavated in deep soils in dense thickets, near streams

or springs. Breeding takes place from December through March, with peak activity in February. Young are born from February through June, with one litter being produced each year. Young are weaned at about 60 days. The diet of the Sierra Nevada mountain beaver (SNMB) consists of the vegetative parts of plants, including dogwood, blackberry, ferns, willows, and grasses (Zeiner et al., 1990).

Sierra Nevada mountain beaver is reported to occur within a five-mile radius of the study area. It is possible that the species occurs within the study area due to presence of suitable habitat, but it was not observed during surveys.

Fisher – west coast DPS (*Martes pennanti*) is an uncommon permanent resident in the Sierra Nevada. It typically occurs in intermediate to large-tree stages of coniferous forest and deciduous riparian habitat, with a high percent canopy closure (greater than 50 percent closure). Fishers den in brush piles, logs, snags, rocky areas, upturned trees or in other protected cavities. Hollow logs and snags are particularly important for denning. Young are typically born in February through May. They then remain with the female until late autumn. The diet of Pacific fisher consists of small mammals such as rabbits, rodents, shrews, birds, fruit and carrion.

There are no reported occurrences of fisher within a five-mile radius of the study area, and it is unlikely to occur due to the close proximity to existing development and ongoing human disturbance. The species was not observed during the surveys.

California wolverine (*Gulo gulo*) is a rare resident of the Sierra Nevada. It generally occurs in denser forest stages at high elevations ranging from approximately 4300 to 7300 feet, or in open terrain above timberline. In the northern Sierra Nevada, this species has been found in mixed conifer, red fir, and lodgepole pine habitats, and in wet meadow and montane riparian habitats. It feeds primarily on carrion and small mammals. Den sites include caves, cliffs, hollow logs, rock outcrops, and ground burrows. Areas with low human disturbance are preferred. Mating typically takes place from May to July, with young being born from January through April. Young are typically weaned at about 7 to 9 weeks of age. While mostly nocturnal, this species may be active any time of the day.

The CNDDB (2018) documents an occurrence of wolverine within five miles of the study area, at Euer Valley, in the vicinity of the South Fork of Prosser Creek and Crabtree Canyon Creek, southeast of Independence Lake in 1991. Occurrences have also been documented inside the entrance to Squaw Valley. A third sighting occurred recently in the Truckee area. Despite these sightings, occurrence of this species in the region is considered very rare. It is unlikely that the species would utilize the study area due to the close proximity to existing development and ongoing human disturbance. It was not observed, nor was its sign, during the field surveys.

Waters of the United States

The study area contains areas that qualify as waters of the United States. Therefore, it is recommended that a wetland delineation, conducted to Corps of Engineers standards, be conducted. Clean Water Act permits from the U.S. Army Corps of Engineers and/or the California Regional Water Quality Control Board will be required prior to engaging in earth-disturbing activities that impact Waters of the U.S.

Streams, Pond, and Riparian Habitat

Streams, ponds, and/or riparian habitat are present within the study area, thus it is likely that a Lake and Streambed Alteration Agreement (LSAA) from the California Department of Fish and Wildlife (CDFW) would be required prior to engaging in any earth-disturbing activity that impacts these resources.

Tree Conservation

Placer County's Tree Preservation Ordinance specifies requirements for the protection, preservation, and maintenance of native oak trees, trees of historic or cultural significance, groves and stands of mature trees, and mature trees in general, which are associated with proposals for development. The applicant should consult with the Placer County Planning Department to determine if any provisions of the ordinance are applicable.

Noxious Weeds

The only noxious weed species identified during the fall 2018 field visits to the Study Area was bull thistle (*Cirsium vulgare*), rated as C by the CDFA. Because C-rated plants are not subject to state-enforced action outside of nurseries, no further actions are necessary at this time regarding noxious weeds. Since other non-native, invasive plant species were also observed, it would be prudent, however, to conduct spring and summer assessments for noxious weeds.

Special-Status Plants

Habitat is present that may support a number of special-status plant species including those identified in Table 3 of this document. While none of the identified species have state or federal status, all of them are CNPS Rank 1B or 2B species, and Placer County may require bloom-period surveys to determine if any individuals are present on site. Should any individual special-status plant species be located within the study area, it may be necessary to develop appropriate mitigation measures in coordination with the Placer County Planning Department.

Special-Status Wildlife

Surveys for potentially occurring special status wildlife species should be made prior to initiation of ground disturbance, depending on the potential impacts of any

proposed project. Many of the potentially occurring special status species may be unaffected by project activities so surveys would be unnecessary. Nesting bird surveys will be necessary regardless of the project particulars.

Nesting Raptors and Migratory Birds

The study area provides suitable nesting habitat for birds of prey and for other birds protected by the Migratory Bird Treaty Act. If ground disturbing activities take place during the breeding/nesting season (typically February 1 through August 31), disturbance of nesting activities could occur. Take of any active bird (including raptors) nest is prohibited under California Fish and Game Code sections 3503, 3503.5, and 3513. To avoid impacts to nesting birds, tree removal should occur between August and February. If tree removal occurs at any time during the nesting season, a pre-construction survey should be conducted by a qualified biologist within two weeks prior to initiation of proposed development activities. If active nests are found on or immediately adjacent to the site, the responsible local agency shall be contacted and if requested, CDFW, to determine appropriate avoidance measures. If no nesting is found to occur, necessary vegetation removal could then proceed.

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Appendix A.
Plant Species Observed Within the Polaris Creek Study Area

Appendix A

Polaris Creek & Wetland - Plants Observed October 2018

Ferns and Allies

Equisetaceae - Horsetail Family

Equisetum laevigatum	Smooth scouring-rush

Gymnosperms

Cupressaceae - Cypress Family

Calocedrus decurrens	Incense cedar

Pinaceae - Pine Family

Pinus contorta subsp. murrayana	Lodgepole pine
Pinus jeffreyi	Jeffrey pine

Angiosperms - Dicots

Amaranthaceae - Amaranth Family

**Amaranthus albus*	Tumble pigweed

Apiaceae (Umbelliferae) - Carrot Family

Heracleum maximum	American cow-parsnip
Perideridia lemmonii	Lemmon's yampah

Asteraceae (Compositae) - Sunflower Family

Achillea millefolium	Common yarrow
Artemisia douglasiana	California mugwort
Artemisia tridentata	Big sagebrush
**Cirsium vulgare*	Bull thistle
**Lactuca serriola*	Prickly lettuce
Madia glomerata	Mountain tarweed
Symphyotrichum bracteolatum	Eaton's aster
**Taraxacum officinale*	Common dandelion
**Tragopogon dubius*	Yellow salsify
Wyethia mollis	Mountain mule's-ears

Betulaceae - Birch Family

Alnus incana subsp. tenuifolia	Mountain alder

Brassicaceae (Cruciferae) - Mustard Family

**Descurainia sophia*	Tansy mustard
**Lepidium campestre*	Field pepperweed
Nasturtium officinale	Watercress

Cornaceae - Dogwood Family

Cornus sericea	Creek dogwood

Fabaceae (Leguminosae) - Legume Family

Acmispon americanus var. americanus	Spanish-clover
**Melilotus indicus*	Annual yellow sweetclover
Trifolium longipes subsp. hansenii	Long-stalk clover
**Trifolium repens*	White clover

Grossulariaceae - Gooseberry Family

Ribes roezlii var. roezlii	Sierra gooseberry

Hypericaceae - St. John's Wort Family

Hypericum scouleri	Western St. John's wort

Linaceae - Flax Family

Linum lewisii	Prairie flax

Onagraceae - Evening Primrose Family

Epilobium brachycarpum	Summer cottonweed
Epilobium ciliatum	Hairy willow-herb
Gayophytum diffusum	Groundsmoke

Phrymaceae - Lopseed Family

Erythranthe guttata	Common monkeyflower

Plantaginaceae - Plantain Family

Penstemon rydbergii var. oreocharis	Rydberg's beardtongue
**Plantago lanceolata*	English plantain
Veronica americana	American brooklime

Polemoniaceae - Phlox Family

Collomia grandiflora	Large-flowered collomia
Microsteris gracilis	Slender phlox

Polygonaceae - Buckwheat Family

Eriogonum nudum var. deductum	Reduced wild buckwheat
**Rumex acetosella*	Sheep sorrel
**Rumex crispus*	Curly dock

Rhamnaceae - Buckthorn Family

Ceanothus cordulatus	Mountain whitethorn

Rosaceae - Rose Family

Amelanchier utahensis	Utah serviceberry
Geum macrophyllum	Large leaf avens
Purshia tridentata	Antelope bitterbrush
Rosa woodsii subsp. ultramontana	Interior rose

Salicaceae - Willow Family

Populus tremuloides	Quaking aspen
Populus trichocarpa	Black cottonwood
Salix lasiandra var. lasiandra	Pacific willow
Salix lemmonii	Lemmon's willow
Salix scouleriana	Scouler's willow

Scrophulariaceae - Figwort Family

**Verbascum thapsus*	Woolly mullein

Urticaceae - Nettle Family

Urtica dioica subsp. holosericea	Hoary nettle

Angiosperms -Monocots

Cyperaceae - Sedge Family

Carex aquatilis var. aquatilis	Water sedge
Carex athrostachya	Slender-beak sedge
Carex nebrascensis	Nebraska sedge

Carex praegracilis	Clustered field-sedge
Carex sp.	Sedge
Carex subfusca	Rusty sedge
Eleocharis macrostachya	Creeping spikerush

Juncaceae - Rush Family

Juncus balticus	Baltic rush
Juncus bufonius var. occidentalis	Western toad rush
Juncus ensifolius	Dagger rush
Juncus nevadensis	Sierra rush

Melanthiaceae - Death Camas Family

Veratrum californicum var. californicum	California corn lily

Poaceae (Gramineae) - Grass Family

**Bromus tectorum*	Cheat grass
**Dactylis glomerata*	Orchard grass
Deschampsia cespitosa	Tufted hair grass
Elymus elymoides var. elymoides	Squirreltail
Elymus glaucus	Blue wildrye
Elymus trachycaulus subsp. trachycaulus	Slender wheatgrass
Hordeum brachyantherum	Meadow barley
Muhlenbergia richardsonis	Mat muhly
**Phleum pratense*	Common timothy
**Poa pratensis subsp. pratensis*	Kentucky bluegrass
Poa secunda	Secund bluegrass

Appendix B.
Potentially-Occurring Special-Status Plants in the Region of the Polaris Creek Study Area

Appendix B

Polaris Creek & Wetland - Potentially-occurring Special-status Plants

Family Taxon Common Name	Status*	Flowering Period	Habitat	Probability on Project Site
Asteraceae (Compositae)				
Artemisia tripartita tripartita Threetip sagebrush	Fed: - State: - CNPS: Rank 2B.3	August-September	Upper montane coniferous forest (rocky, volcanic openings).	Unlikely. Only marginal habitat occurs within study area.
Erigeron eatonii nevadincola Nevada daisy	Fed: - State: - CNPS: Rank 2B.3	May-July	Great Basin scrub; lower montane coniferous forest; pinyon and juniper woodland (rocky).	Unlikely. Only marginal habitat occurs within study area.
Boraginaceae				
Phacelia stebbinsii Stebbins' phacelia	Fed: FSS State: - CNPS: Rank 1B.2	May-July	Cismontane woodland; lower montane coniferous forest; meadows and seeps. (primarily rock outcrops and rubble piles).	Unlikely. Only marginal habitat occurs within study area.
Brassicaceae (Cruciferae)				
Arabis rigidissima var. demota Galena Creek rockcress	Fed: - State: - CNPS: Rank 1B.2	July-August	Broadleaved upland forest, upper montane coniferous forest. Well-drained, stony soil underlain by basic volcanic rock. 2255-2560 m.	None. Study area lacks suitable habitat.
Rorippa subumbellata Tahoe yellow cress	Fed: FC State: CE CNPS: Rank 1B.1	May-September	Found only on the shoreline of Lake Tahoe. It lives only on the sandy beaches and dunes at the ever-changing margin of the lake.	Possible. Occurs only on the Lake Tahoe shoreline.
Cyperaceae				
Carex davyi Davy's sedge	Fed: FSW State: - CNPS: Rank 1B.3	May-June	Subalpine coniferous forest; upper montane coniferous forest.	Possible. Suitable habitat occurs witin study area.

Appendix C

Polaris Creek & Wetland - Potentially-occurring Special-status Plants

Family Taxon Common Name	Status*	Flowering Period	Habitat	Probability on Project Site
Carex lasiocarpa Woolly-fruited sedge	Fed: FSW State: - CNPS: Rank 2B.3	June-July	Bogs and fens; marshes and swamps; [freshwater, lake margins].	Possible. Suitable habitat occurs witin study area.
Carex limosa Mud sedge	Fed: FSW State: - CNPS: Rank 2B.2	June-August	Bogs and fens [lower montane coniferous forest; upper montane coniferous forest].	Possible. Suitable habitat occurs witin study area.
Juncaceae				
Juncus luciensis Santa Lucia dwarf rush	Fed: FSS State: - CNPS: Rank 1B.2	April-July	Chaparral; Great Basin Scrub; lower montane coniferous forest; meadows and seeps; vernal pools [mesic locations].	Possible. Suitable habitat occurs within study area.
Lamiaceae (Labiatae)				
Scutellaria galericulata Marsh skullcap	Fed: FSW State: - CNPS: Rank 2B.2	June-September	Lower montane coniferous forest; meadows (mesic); marshes and swamps.	Possible. Suitable habitat occurs witin study area.
Malvaceae				
Sphaeralcea munroana Munroe's desert mallow	Fed: - State: - CNPS: Rank 2B.2	May-June	Great Basin scrub.	Unlikely. Only marginal habitat occurs within study area.
Onagraceae				
Epilobium oreganum Oregon fireweed	Fed: - State: - CNPS: Rank 1B.2	June-September	Bogs and fens; lower montane coniferous forest; [mesic].	Possible. Suitable habitat occurs witin study area.

Appendix C

Polaris Creek & Wetland - Potentially-occurring Special-status Plants

Family Taxon Common Name	Status*	Flowering Period	Habitat	Probability on Project Site
Ophioglossaceae				
Botrychium ascendens Uspswept moonwort	Fed: FSS State: - CNPS: Rank 2B.3	July-August	Lower montane coniferous forest [mesic]; meadows and seeps.	Possible. Suitable habitat occurs witin study area.
Botrychium crenulatum Scalloped moonwort	Fed: FSS State: - CNPS: Rank 2B.2	June-July	Lower montane coniferous forest; bogs and fens; meadows; marshes and swamps (freshwater).	Possible. Suitable habitat occurs witin study area.
Botrychium minganense Mingan moonwort	Fed: FSS State: - CNPS: Rank 2B.2	July-September	Upper and lower montane coniferous forest (mesic); bogs and fens.	Possible. Suitable habitat occurs witin study area.
Botrychium montanum Western goblin	Fed: FSS State: - CNPS: Rank 2B.1	July-September	Upper and lower montane coniferous forest (mesic); meadows and seeps.	Possible. Suitable habitat occurs witin study area.
Poaceae (Gramineae)				
Glyceria grandis American mannagrass	Fed: FSW State: - CNPS: Rank 2B.3	June-August	Bogs and fens; meadows; marshes and swamps (streambanks and lake margins).	Possible. Suitable habitat occurs witin study area.
Polygonaceae				
Eriogonum umbellatum torreyanum Donner Pass buckwheat	Fed: - State: - CNPS: Rank 1B.2	July-September	Meadows; upper montane coniferous forest; [volcanic, rocky].	Unlikely. Only marginal habitat occurs within study area.

Appendix C

Polaris Creek & Wetland - Potentially-occurring Special-status Plants

Family Taxon Common Name	Status*	Flowering Period	Habitat	Probability on Project Site
Potamogetonaceae				
Potamogeton epihydrus nuttallii Nuttall's ribbon-leaved pondweed	Fed: - State: - CNPS: Rank 2B.2	July-August	Marshes and swamps (assorted shallow freshwater).	None. Study area lacks suitable habitat (ponds).
Stuckenia filiformis alpina Slender-leaved pondweed	Fed: FSW State: - CNPS: Rank 2B.2	May-July	Marshes and swamps (assorted shallow freshwter).	None. Study area lacks suitable habitat (ponds).
Rhamnaceae				
Rhamnus alnifolia Alder buckthorn	Fed: FSW State: - CNPS: Rank 2B.2	May-July	Upper and lower montane coniferous forests; meadows and seeps; riparian scrub. 1370-2130 meters.	Possible. Suitable habitat occurs witin study area.
Rosaceae				
Ivesia sericoleuca Plumas ivesia	Fed: FSS State: - CNPS: Rank 1B.2	May-September	Great Basin scrub; lower montane coniferous forest; meadows and seeps; vernal pools; [vernally mesic, usually volcanic].	Possible. Suitable habitat occurs witin study area.

Appendix C

Polaris Creek & Wetland - Potentially-occurring Special-status Plants

Family Taxon Common Name	Status*	Flowering Period	Habitat	Probability on Project Site

***Status**

Federal:
FE - Federal Endangered
FT - Federal Threatened
FPE - Federal Proposed Endangered
FPT - Federal Proposed Threatened
FC - Federal Candidate
FSS - Forest Service Sensitive
FSW - Forest Service Watchlist

State:
CE - California Endangered
CT - California Threatened
CR - California Rare
CSC - California Species of Special Concern

CNPS (California Native Plant Society - List.RED Code):
Rank 1A - Extinct
Rank 1B - Plants rare, threatened, or endangered in California and elsewhere
Rank 2A- Plants extinct in California, but more common elsewhere
Rank 2B - Plants rare, threatened, or endangered in California, more common elsewhere
Rank 3 - Plants about which more information is needed, a review list
Rank 4 - Plants of limited distribution, a watch list
RED Code
1 - Seriously endangered (>80% of occurrences threatened)
2 - Fairly endangered (20 to 80% of occurrences threatened)
3 - Not very endangered (<20% of occurrences threatened)

Appendix C.
Potentially-Occurring Special-Status Animals in the Region of the Polaris Creek Study Area

Appendix C

Polaris Creek & Wetland - Potentially-occurring Special-status Animals

	Status*	Habitat	Probability on Project Site
Fish			
Lahontan cutthroat trout *Oncorhynchus clarki henshawi*	Fed: FT State: - Other: -	Historically found in all cold waters of the Lahontan Basin, including Independence Lake.	Unlikely. Recently being re-introduced to Lake Tahoe. Most self-sustaining populations are located in isolated headwater streams and are the result of reintroduction efforts.
Amphibians			
Sierra Nevada yellow-legged frog *Rana sierrae*	Fed: FE State: CT Other: SSC	Associated with streams, lakes, and ponds in montane riparian, lodgepole pine, subalpine conifer and wet meadow habitats. Occurs in the northern and central portions of the Sierra Nevada at elevations above 4,500 feet. Always near water.	Possible. Suitable habitat occurs within study area.
Northern leopard frog *Lithobates pipiens*	Fed: - State: SSC Other:	Known from a variety of aquatic habitats. Endemic populations potentially occur in Truckee River drainage. Prefers permanent water and abundant adjacent aquatic vegetation.	Unlikely. Suitable habitat within study area, but species is uncommon in the region.
Southern long-toed salamander *Ambystoma macrodactylum sigillatum*	Fed: - State: - Other: SSC	Inhabits alpine meadows, high mountain ponds and lakes.	Possible. Suitable habitat occurs within study area.
Birds			
Bald eagle *Haliaeetus leucocephalus*	Fed: - State: CE Other: CFP	Occurs along shorelines, lake margins, and rivers. Nests in large, old-growth or dominant trees with open branches.	Unlikely. Only very marginal nesting habitat present within study area.
Northern goshawk *Accipiter gentilis*	Fed: - State: SSC Other: *	Dense, mature coniferous forests, most typically dense fir stands in the Sierra Nevada mountains.	Possible. Suitable nesting habitat in coniferous forest.
Willow flycatcher *Empidonax traillii*	Fed: - State: CE Other: *	Uncommon summer resident in upper elevation montane riparian and wet meadow areas, usually with a thick growth of shrubby willow.	Possible. Nesting habitat present within study area.

Appendix D

Polaris Creek & Wetland - Potentially-occurring Special-status Animals

	Status*	Habitat	Probability on Project Site
Yellow warbler *Setophaga petechia*	Fed: - State: SSC Other: *	Breeds in riparian vegetation throughout California; populations in Sacramento and San Joaquin valleys are declining. Common in eastern Sierran riparian habitats below 8,000 feet.	Likely. Suitable nesting habitat present in willow scrub in the study area.
Mammals			
Sierra Nevada snowshoe hare *Lepus americanus tahoensis*	Fed: - State: SSC Other: -	Montane riparian habitats with thickets of alders and willows and in stands of young conifers interdispersed with chaparral. Early seral stages of mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and aspen, usually along edges.	Possible. Suitable habitat occurs within study area.
White-tailed jackrabbit *Lepus townsendii*	Fed: - State: SSC Other: -	Sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grassland habitats. Also found in low sagebrush, wet meadow, and early successional stages of conifer habitats. Prefers open areas with scattered shrubs.	Unlikely. Only marginal habitat occurs within study area.
Sierra Nevada mountain beaver *Aplodontia rufa californica*	Fed: - State: SSC Other: -	Dense decidious trees and shrubs in riparian habitat with an abundant source of water.	Possible. Suitable habitat occurs within study area.
Fisher - West Coast DPS *Pekania pennanti*	Fed: FPT State: CC Other: SSC	Occurs in intermediate to large-tree stage coniferous forests and riparian woodlands with a high percent level of canopy closure. .	Unlikely. Only marginal habitat and high-use human habitation areas within study area.
California wolverine *Gulo gulo*	Fed: FPT State: CT Other: CFP	Habitat generally consists of open terrain above the timberline, but has been observed at 1500 feet. Prefer areas with low human disturbance. Use caves, hollows in cliffs, logs, rock outcrops, and burrows for cover, generally in denser forest stages.	Unlikely. Uncommon in the region, and avoids areas with human habitation.

Appendix D

Polaris Creek & Wetland - Potentially-occurring Special-status Animals

	Status*	Habitat	Probability on Project Site

***Status**

Federal:	State:	Other:
FE - Federal Endangered	CE - California Endangered	Some species have protection under the other designations, such as the California Department of Forestry Sensitive Species, Bureau of Land Management Sensitive Species, U.S.D.A. Forest Service Sensitive Species, and the Migratory Bird Treaty Act. Raptors and their nests are protected by provisions of the California Fish and Game Code. Certain areas, such as wintering areas of the monarch butterfly, may be protected by policies of the California Department of Fish and Game.
FT - Federal Threatened	CT - California Threatened	
FPE - Federal Proposed Endangered	CR - California Rare	
FPT - Federal Proposed Threatened	CC - California Candidate	
FC - Federal Candidate	CFP - California Fully Protected	
FPD - Federal Proposed for Delisting	CSC - California Species of Special Concern	WL - CDFG Watch List

MEMORANDUM

To: Peter Kulchawik

From: Jeff Glazner

Date: May 12, 2020

Subject: Polaris Park Relocation Sites Summary

This memorandum addresses the ten relocation sites. Three of the sites are for potential relocation of the ballfields and seven are for potential relocation of the campground. An exhibit of each site is included, and general habitat types are mapped. Where SIG mapped SEZ features, those are depicted prominately and detailed in the exhibits. Areas mapped as SEZ but do not appear to be three parameter wetlands are noted in the text below.

Number	Name	Acreage	Use
2	64 Acres North	4.7	Ballfield
3	64 Acres East	7.2	Campground
5	Tahoe SRA	5.0	Campground
7	Lake Forest North	5.4	Campground
8	Lake Forest South	2.4	Campground
9	Lake Forest Glen	7.9	Campground
12	Skylandia	23.3	Campground
14	Firestone	74.0	Campground
15	Highlands West	2.4	Ballfield
16	Rideout	11.6	Ballfield

2 Open forest with existing parking lot. Truckee River and transit hub nearby. No apparent wetlands or waterways. No mapped SEZ. Few constraints.

3 Open to dense forest adjacent to Lake Tahoe. Adjacent to Hwy 89 with one road crossing. Relatively undisturbed. No apparent wetlands or waterways. No mapped SEZ. Few constraints.

5 Open forest with minimal canopy coverage. Along Hwy 28. Relatively undisturbed. One Forested SEZ polygon (1.6ac) is mapped but the site appears to be mostly upland.

7 Dense forest along Hwy 28. Relatively undisturbed. No apparent wetlands or waterways. No mapped SEZ. Few constraints.

8 Dense forest adjacent to Lake Tahoe. Relatively undisturbed. No apparent wetlands or waterways. No mapped SEZ. Few constraints.

9 Open forest with moderate canopy coverage. Along Hwy 28. Relatively undisturbed. No mapped SEZ. An ephemeral stream is located in the eastern portion and flows into a seasonal stream south of the parcel. Few constraints.

12 Dense forest near Lake Tahoe with open areas in northeast and southwest. Relatively undisturbed. Contains wetlands and waterways including six SEZ polygons: Forested SEZ (12.6ac), Meadow SEZ (0.8ac), Seep/Spring SEZ (0.2ac), and Riverine/Confined Channel SEZ (0.1ac). Although this site has substantial wetland constraints, approximately 15 acres are upland forest.

14 Moderately dense and uniform parcel adjacent to Hwy 28. Relatively undisturbed. One mapped SEZ feature is located along the eastern boundary, a Riverine/Confined Channel (0.1ac). No other apparent wetlands or waterways. Few constraints.

15 Existing High School turfed area (soccer field, track and field). No constraints.

16 Existing Rideout Community Center. Approximately two-thirds of the parcel is undisturbed forest and the remainder is buildings, pavement and turf. One SEZ feature, Riverine/Confined Channel (0.2ac) is located in the southeast area of the site. Few constraints other than southern drainage.

Salix consulting, inc.	N 0 2,000 4,000 Feet	Source Maps: USGS Topographic Map Tahoe City/Kings Beach Quads 1:24,000	**Figure 1** **SITE AND VICINITY MAP** *Pomin Park* Placer County, CA

Salix consulting, inc.

N

0 1,500 3,000

Feet

Pomin Park
(±21 acres)

Figure 2

RELOCATION SITES

Pomin Park

Placer County, CA

Salix consulting, inc.

N

0 75 150

Feet

Site 2 (±4.7ac)
Ballfield

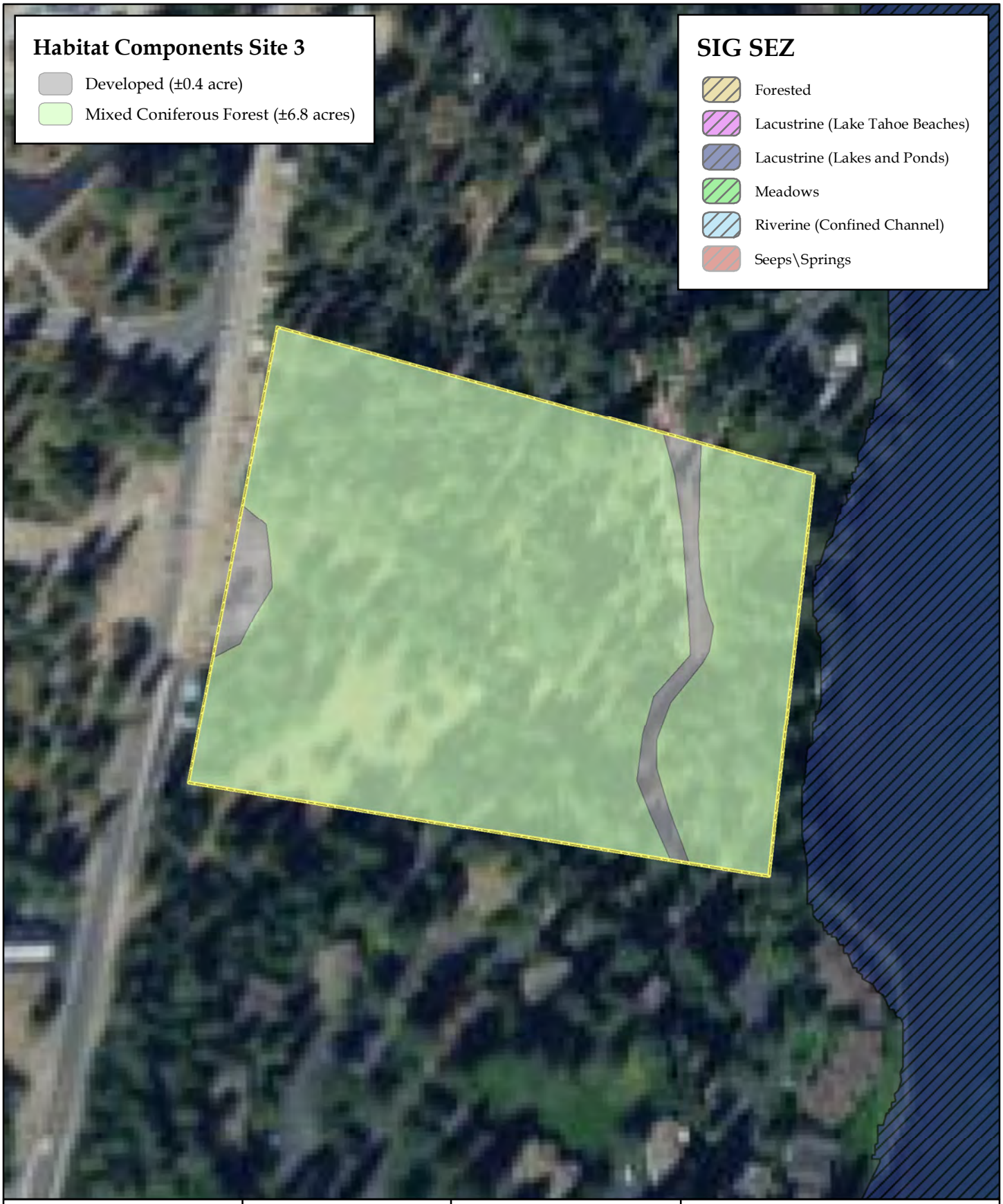
Imagery: 2018 USDA NAIP

Figure 3

RELOCATION SITE 2

Pomin Park

Placer County, CA



Salix consulting, inc.

N

0 75 150

Feet

Site 3 (±7.2ac)
Campground

Imagery: 2018 USDA NAIP

Figure 4

RELOCATION SITE 3

Pomin Park

Placer County, CA

Salix consulting, inc.

N

0 75 150

Feet

Site 5 (±5.0ac)
Campground

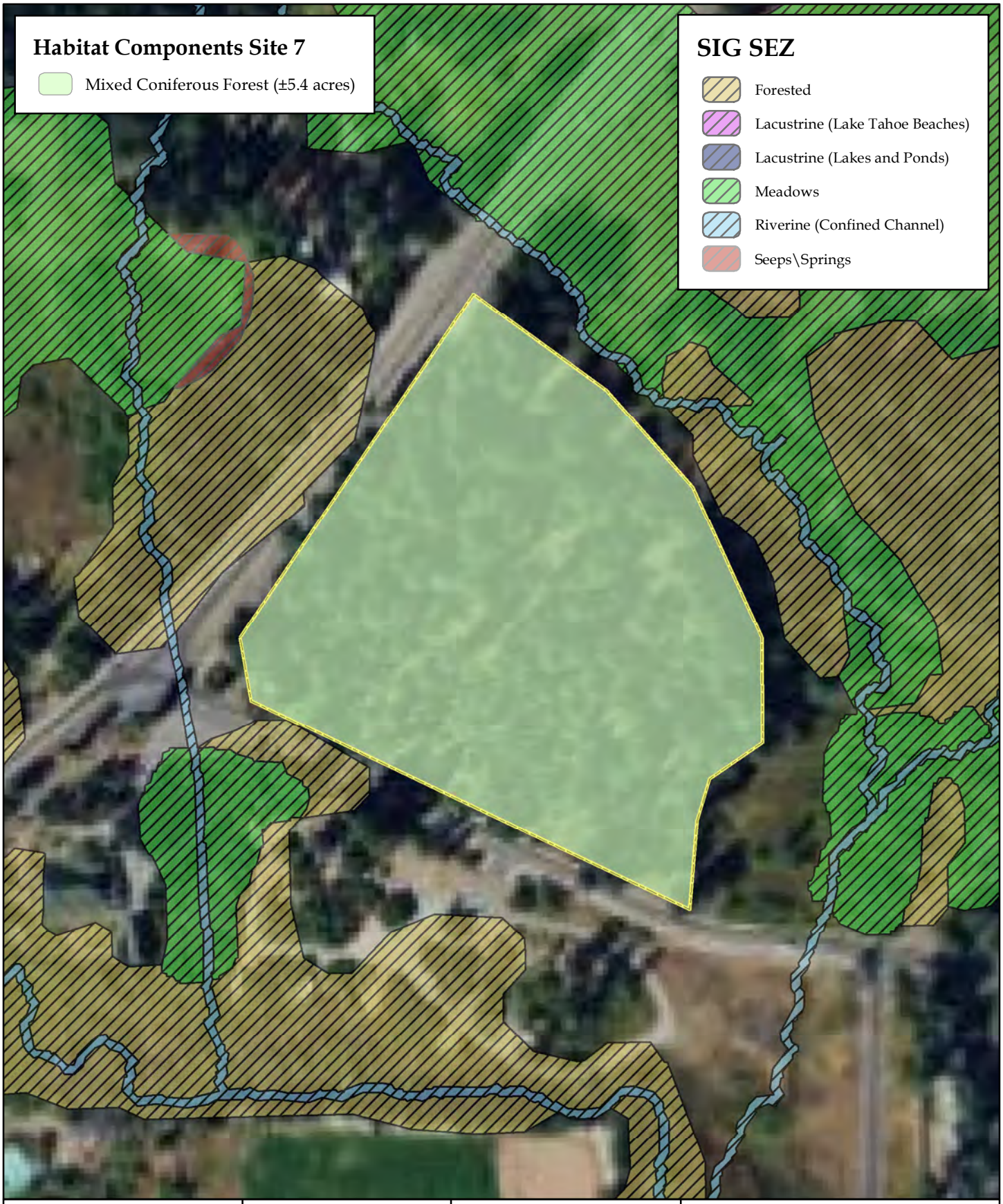
Imagery: 2018 USDA NAIP

Figure 5

RELOCATION SITE 5

Pomin Park

Placer County, CA



Salix consulting, inc.

N

0 75 150

Feet

Site 7 (±5.4ac)
Campground

Imagery: 2018 USDA NAIP

Figure 6

RELOCATION SITE 7

Pomin Park

Placer County, CA

Salix consulting, inc.

N

0 75 150

Feet

Site 8 (±2.4ac)
Campground

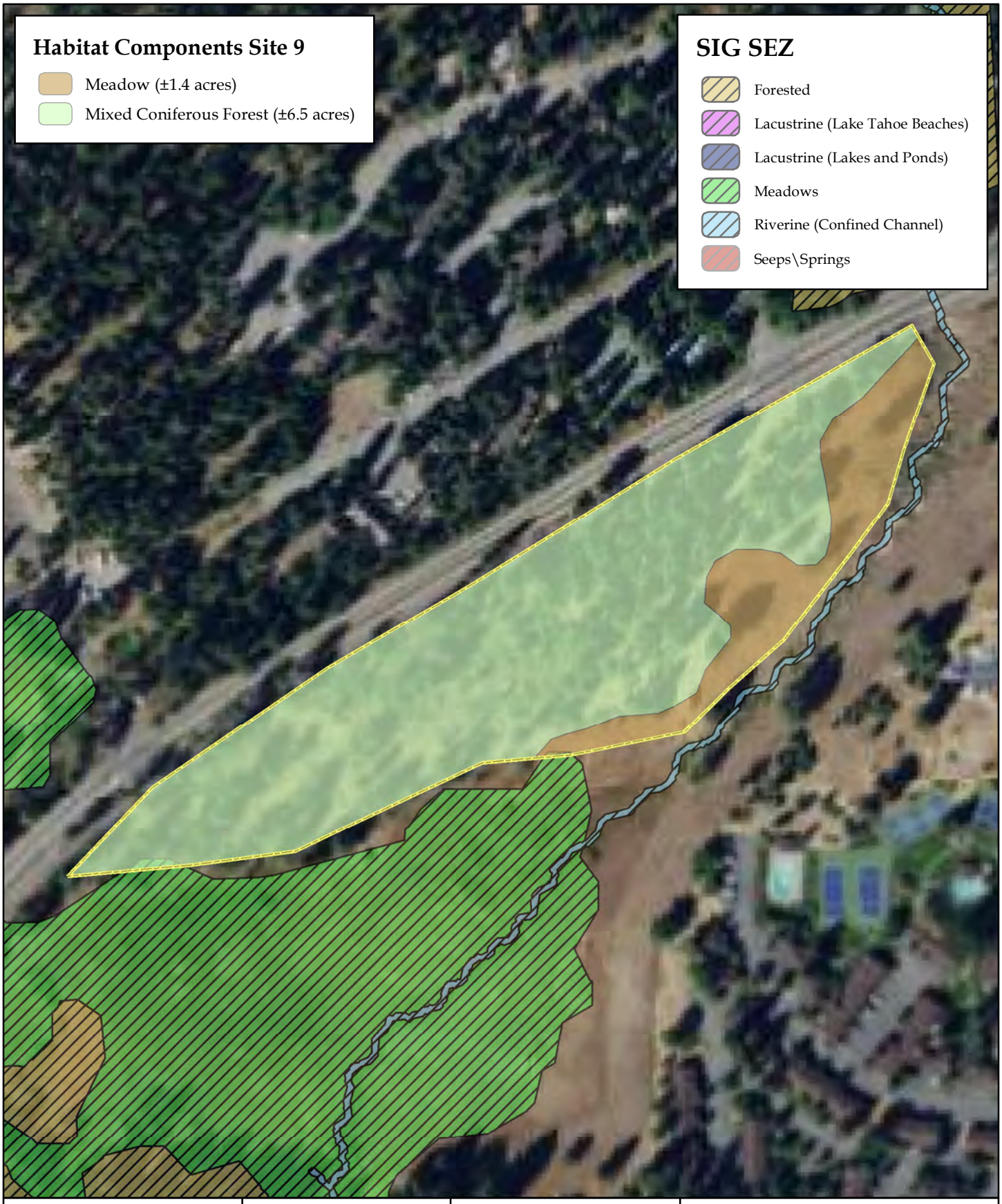
Imagery: 2018 USDA NAIP

Figure 7

RELOCATION SITE 8

Pomin Park

Placer County, CA



Salix consulting, inc.

N

0 100 200

Feet

Site 9 (±7.9ac)
Campground

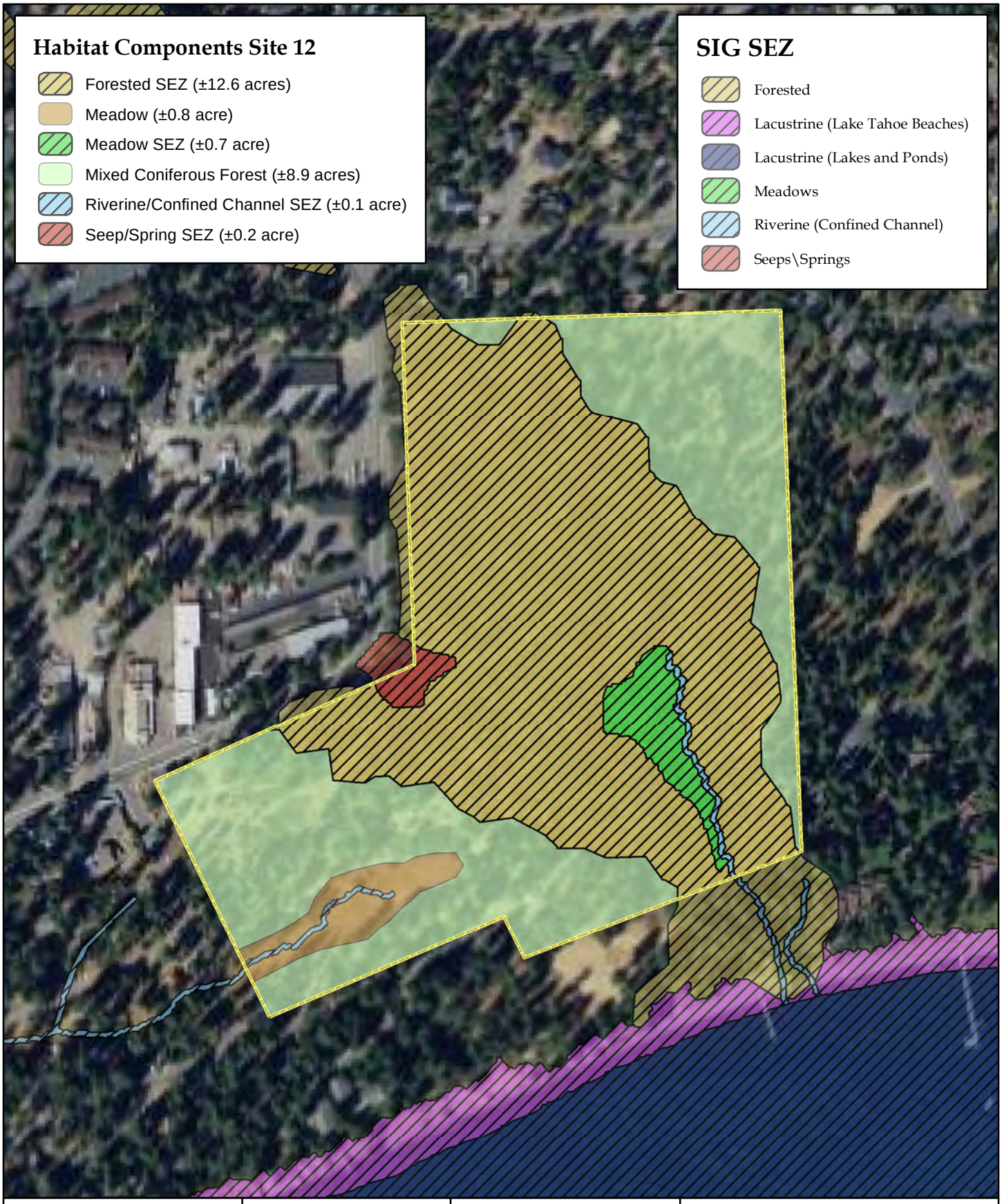
Imagery: 2018 USDA NAIP

Figure 8

RELOCATION SITE 9

Pomin Park

Placer County, CA



Salix consulting, inc.

N

0 125 250

Feet

Site 12 (±23.3ac)
Campground

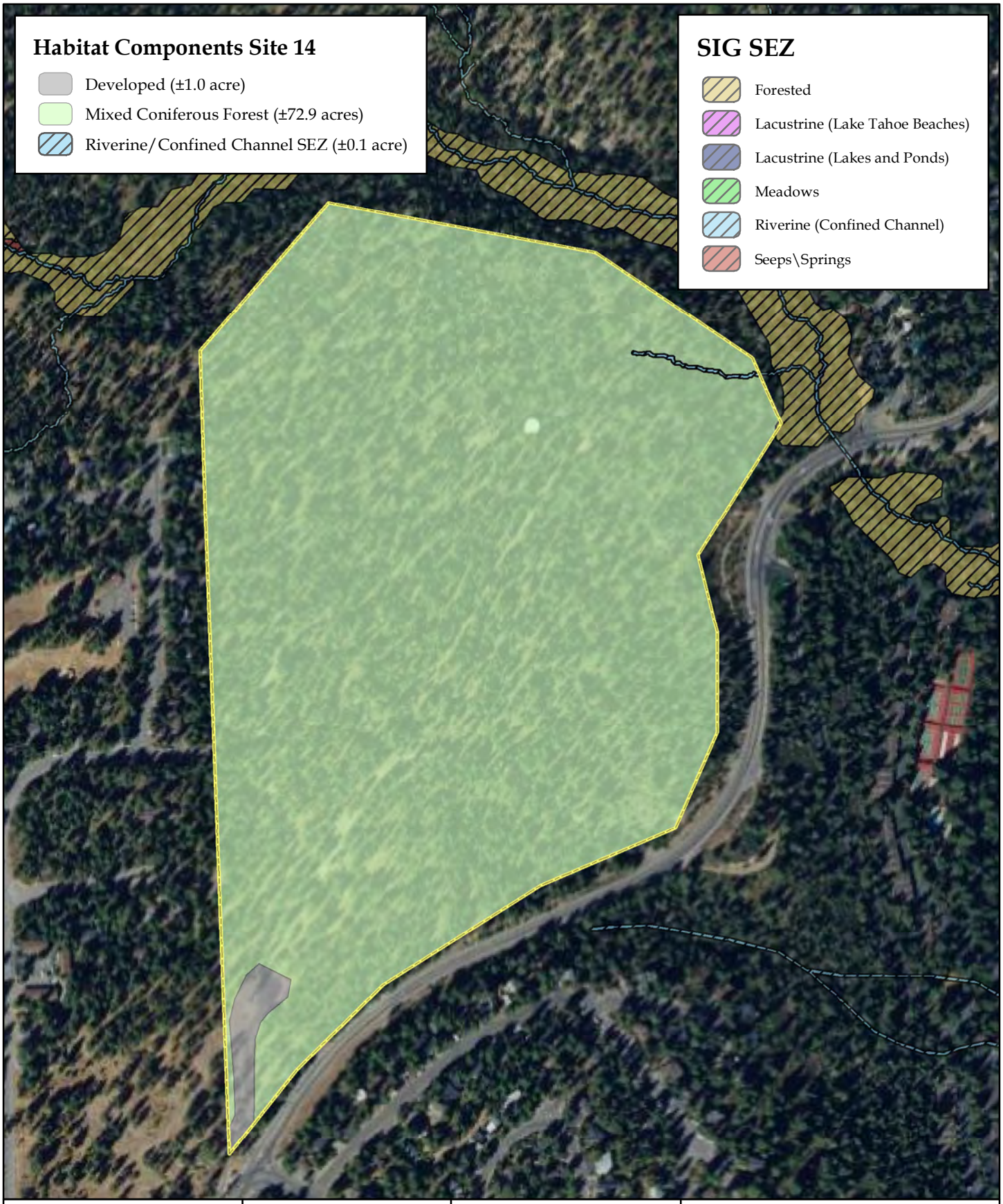
Imagery: 2018 USDA NAIP

Figure 9

RELOCATION SITE 12

Pomin Park

Placer County, CA



Salix consulting, inc.

N

0 200 400

Feet

Site 14 (±74ac)
Campground

Imagery: 2018 USDA NAIP

Figure 10

RELOCATION SITE 14

Pomin Park

Placer County, CA

Salix consulting, inc.

N

0 100 200

Feet

Site 15 (±2.4ac)
Ballfield

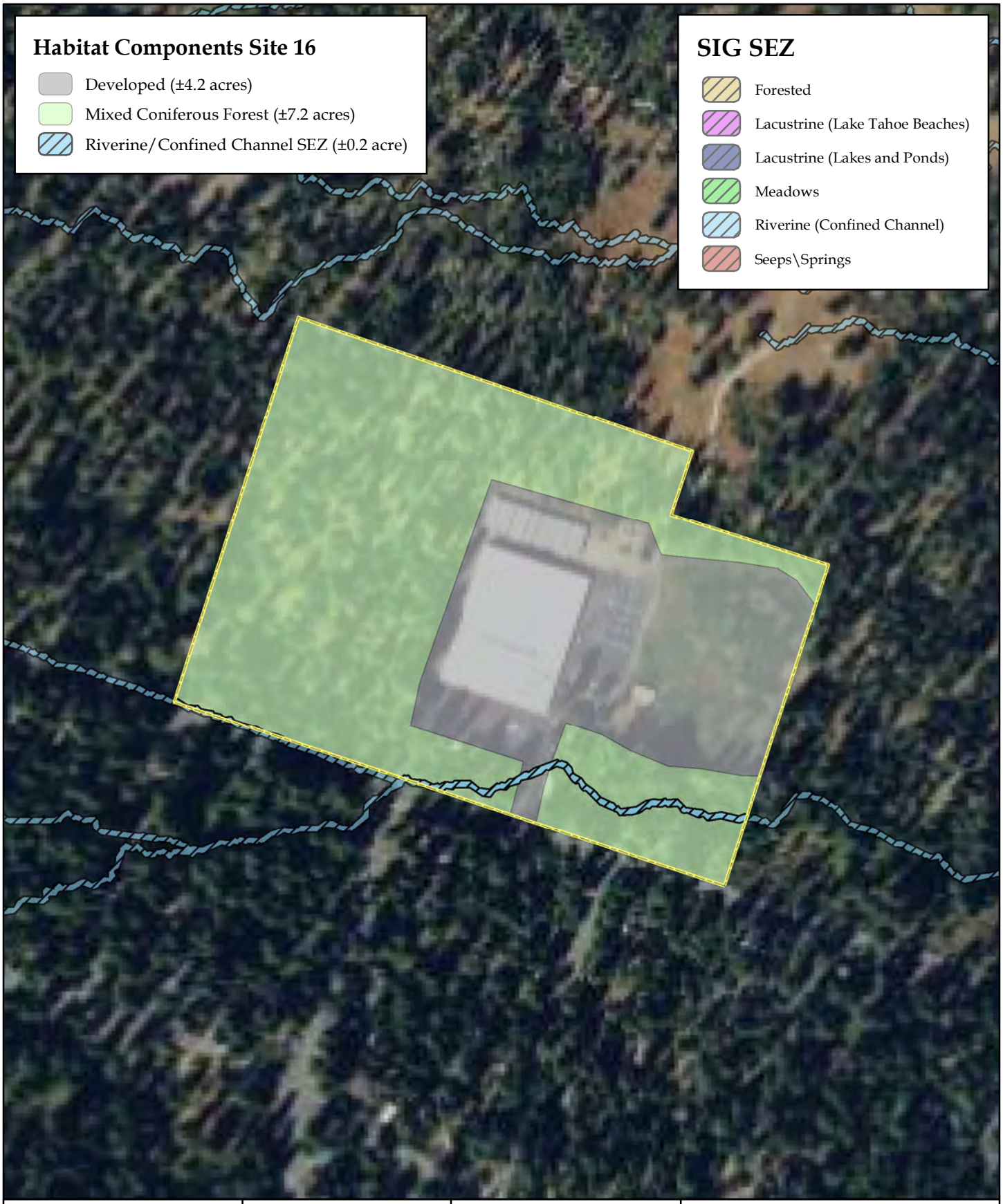
Imagery: 2018 USDA NAIP

Figure 11

RELOCATION SITE 15

Pomin Park

Placer County, CA



Salix consulting, inc.

N

0 100 200

Feet

Site 16 (±11.6ac)
Ballfield

Imagery: 2018 USDA NAIP

Figure 12

RELOCATION SITE 16

Pomin Park

Placer County, CA

APPENDIX C

Summary of Public Input

Summary of Public Input
Pomin Park + Polaris Creek Project

Summary of Outreach Efforts

Outreach to engage community members regarding the Pomin Park + Polaris Creek Project occurred in September and November 2019. To publicize the outreach effort, and to invite participation in the online survey and community workshop, emails were sent to all coaches of the local youth soccer teams (AYSO), as well as to main contacts for local homeowner associations (Highlands HOA, Dollar Point HOA, Star Harbor HOA). Local papers included the workshop in their calendar of events (Moonshine Ink, Sierra Sun, Tahoe Daily Tribune, Tahoe.com), and printed short pieces on the project (Sierra Sun). In addition, informational flyers were sent out with utility bills (TCPUD), in local agency newsletters (Placer County) and posted on various social media platforms (Tahoe RCD, California Tahoe Conservancy).

Approximately 90 community members provided their input. The following breakdown describes how they participated:

- 40 individual interviews conducted in Pomin Park, October 5, 2019
- 29 online survey participants between early October and late November 2019
- Approximately 20 attendees at the Community Workshop at North Tahoe High School in Tahoe City, November 5, 2019

Key Themes and Responses

Those engaged utilize Pomin Park for activities ranging from youth and adult sports practice and games, to dog walking and bird watching, as well as playground, beach and lake access. The frequency of use reported is approximately:

- 25% 1-5 times per year
- 20% 5-10 times per year
- 25% 10-20 times per year
- 30% over 20 times per year

The following themes emerged from the interviews, online surveys and workshop input:

1. Strong Support for Restoration of the Polaris Creek Wetlands
2. Strong Need to Maintain and Enhance Recreation Amenities in Tahoe City
3. Desire to Maintain Recreation Access at the Existing Pomin Park Location
4. Desire to Preserve and Improve Camping Amenities

Specific interview and survey questions asked are included at the end of this summary.

1. Strong Support for Restoration of the Polaris Creek Wetlands

A strong majority of participants expressed support for the restoration of Polaris Creek and associated wetlands. Approximately 85% said “yes” when asked if the restoration of Polaris

Creek area by relocating Pomin Park is a good idea, with about 85% indicating restoration efforts of Polaris Creek wetlands are either important (20%), very important (40%), or somewhat important (25%). Reasons cited for support for restoration include wetland and habitat restoration, along with reinstating the hydrologic function and water filtration of the wetlands to preserve lake clarity.

The few (15%) who did not express support for the relocation of Pomin Park ballfields and campground in order to restore Polaris Creek wetlands cited the following reasons:

- No current erosion or water quality impacts are noticed
- The fields are already in place and relocation would have additional ecologic impacts
- Concern over who will pay for relocation and restoration, with an emphasis on the efficient use of public funds
- Disbelief that the fields would be replaced prior to restoration efforts starting

2. Strong Need to Maintain and Enhance Recreation Amenities in Tahoe City

A majority of participants highlighted their strong preference that the fields are replaced before restoration efforts start so the community does not experience any loss of access to sports fields.
Specific comments and suggestions include:

- "If Tahoe City doesn't lose any of the amenities that Pomin Park currently provides, but improves upon those amenities then this project could be a huge success for families, recreation, and the environment."
- "It is important for community support that the ball fields are replaced in kind or upgraded."

Many participants indicated this project provides an opportunity for upgraded fields and recreation amenities in Tahoe City. Many expressed the desire for additional field space to accommodate more programs and activities, while a couple of participants liked the idea of condensing the existing fields at Pomin Park to allow for partial restoration of the area. The most common suggestions for upgrading fields and expanding recreation amenities include:

- Well maintained, separate use ballfields for soccer and baseball
    - Fields for both soccer and baseball use during the same time in spring
    - Large enough area for teams to play with space for warming up
    - Enough soccer and baseball fields to support area and population growth
    - Consider splitting the soccer and baseball fields to two different locations if there is added benefit
    - Long season use - lower elevation fields with good sun exposure and drainage that are useable in variable weather conditions
    - Fields oriented north to south to avoid sun in player's eyes
    - Natural grass fields that require low water and maintenance

- Centrally located for all North Tahoe communities, especially Tahoe City
    - Easy access from the main road close to other amenities
    - Does not add to traffic safety and congestion concerns
    - Noise to nearby residences is controlled or minimized
    - Carefully planned flow of traffic, drop off and parking areas
    - Adequate parking
- A modern, safe playground close to the ballfields
- Indoor pool and recreation facilities for extended youth sports programs
- A skate park or other recreation opportunities for older youth and teens
- Lights for extended play, with concern for neighbors and light pollution
- Bathrooms that are accessible
- Seating for fans and families
- Natural trees for shade and reduced environmental impact
- Dog friendly
- Dedicated to Robert Pomin in the same way as the existing park

Participant Suggestions for Relocation of Ballfields and Amenities

Prior to discussing specific site relocation options, the planning team talked through a list of potential sites under consideration in the feasibility study. Comments and suggestions on each location are as follows:

Firestone Property (across Hwy 28 from Dollar Drive)

Pros:

- It is a big property and would allow for expansion of recreational facilities and fields
- Add a public pool and other amenities to this location

Cons/Considerations:

- Traffic and congestion would be too high with other development going on nearby
- It is too close to the highway
- Turning in and out of this property from the highway would be dangerous
- Lights at this location could impact homeowners and would need to be limited

64 Acres (adjacent to Tahoe City transit center)

Pros:

- Easy access and transportation options close to the transit center
- Low elevation is favorable for use of fields in the spring
- Lights at this location would not disturb neighbors
- There is parking and bathrooms already in place

Cons/Considerations:

- It is currently used by rafters who take all of the parking spots in the summer, parking would need to be addressed
- Small area, maybe split the baseball and soccer fields and just have one sport here

North Highland High School

Pros:

- Parking and other infrastructure are already in place

Cons/Considerations:

- AYSO has had to move fields in recent years and has had challenging experiences trying to share fields with the high school
- There is already enough traffic and it is not a good location to add more
- It is hard to access off the main road by bike or transit
- The elevation would limit seasonal use

Rideout

Pros:

- Existing parking and infrastructure are already in place

Cons/Considerations:

- Fields are shaded by trees and still under snow late in spring
- Access to the property is not good
- There is no room to expand the fields at this location

Skylandia

Cons/Considerations:

- This area has heavy bear activity
- There would be a big impact to the surrounding neighborhood

3. Desire to Maintain Recreation Access at the Existing Pomin Park Location

Participants expressed the importance of maintaining some recreation access to the current Pomin Park location. Many offered comments and suggestions for recreation features they would like to see preserved and enhanced as restoration efforts of Polaris Creek wetlands are undertaken. They include:

- Keep a playground - it is currently well used and the only one in the area
- Keep picnic tables and a day use area
- Keep the area walkable, incorporating a nature trail throughout the restored wetland with a raised board walk that allows for nature viewing and bird watching, and gives users a first-hand experience of how wetlands function
- Add interpretive signs to educate users about wetlands, forest ecology, and the important role that wetlands play in keeping Tahoe blue

- This is one of the best sites in North Lake Tahoe and possibly Placer County for birdwatching, and should be restored with that in mind
- Allow for dog walking
- Create kayak camp sites and launch area
- Consider the amount of beavers that will be utilizing the space
- Keep some parking for single cars, but do not add more boat trailer parking
- Take into consideration that once a year the Tahoe Yacht Club/Coast Guard host a regatta + laser races and boats are kept on the fields

4. Desire to Preserve and Improve Camping Amenities

Participants support the relocation of the campground, as long as the net total of local campsites are preserved. Many of those familiar with the Lake Forest Campground noted that the campsites are often soggy and water logged, with some sites unusable for most of the season due to creek flooding. Participants were concerned with preserving the net total of campsites in the area, while supportive of moving them nearby to a more suitable location. Comments and suggestions include:

- Make sure to preserve the net total of campsites available if some or all are moved
- Add a kayak camping area close to the lake
- Move campsites to a well-designed, well-maintained campground close to the lake

Interview and Survey Questions Focused on the Relocation of the Ballfields and Restoration of Pomin Park

1. How often do you use Pomin Park each year?
2. How do you utilize Pomin Park?
    a. Little League Baseball
    b. AYSO Soccer
    c. Adult Soccer
    d. Playground
    e. Other

3. What are your favorite features of the park?

4. What are some challenges you or your family experience utilizing Pomin Park?

5. There are a few properties suitable for a potential relocation of Pomin Park ballfield. If the ballfield were to be relocated, do you have a suggestion for where? *(Examples: Firestone Property located across Hwy 28 from Dollar Point, where the new bike trail parking is located; Adjacent to North Tahoe High School existing ballfields; Adjacent to transit center near Truckee River Dam)*

6. What are your main priorities for the use of a ballfield at Pomin Park or a potential relocation site? What is most important to you and your family? *(Examples: proximity to home, access to parking, having playground adjacent to ballfield)*

7. What would you like partner organizations and agencies to know about this potential project?

8. What questions do you have regarding the potential relocation of the ballfield?

9. Do you think the restoration of Polaris Creek area by relocating Pomin Park is a good idea? Yes/No. What are your main reasons?

10. How important is it to continue restoration efforts of Polaris Creek?
    a. Not at all
    b. Somewhat Important
    c. Important
    d. Very Important

11. What are the best outcomes for this potential project for: Pomin Park users? Tahoe City? Lake Tahoe?

12. Might you be able to attend a workshop scheduled for the evening of November 5th at North Tahoe High School?

13. Are there other people or affiliations you know who should be aware of or involved in this discussion?

Interview and Survey Questions Focused on the Relocation of the Campground and Restoration of Pomin Park

1. How often do you utilize Lake Forest campground?
    a. Never
    b. 1-2 times a year
    c. 3-5 times a year
    d. More than 5 times a year

2. What are your favorite features of Lake Forest Campground?

3. What are you least favorite features of Lake Forest Campground?

4. What do you think about the potential relocation of some or all of the campsites to parks nearby? Do you have any suggestions for potential relocation sites?

5. Do you think the restoration of Polaris Creek area by relocating the campground is a good idea? Yes/No. What are your main reasons?

6. How important is it to continue restoration efforts of Polaris Creek?
    a. Not at all
    b. Somewhat Important
    c. Important
    d. Very Important

7. What are the best outcomes for this potential project for: campground users? Tahoe City? Lake Tahoe?

APPENDIX D

Annotated Bibliography

Heyvaert, A., 2008, Draft Polaris Creek Monitoring Report, 3 p + photographs, figures, and tables.

Unpublished hydrologic monitoring data to support restoration projects around the U.C. Davis Tahoe City Fish Hatchery. Non-continuous measurements of groundwater levels and streamflow for portions of Water Years 2007 and 2008.

Lindström, S., 2019, Polaris-Pomin Wetland Complex Project Phase 1A Cultural Resource Inventory – Archaeological Literature Review and native American Consultation: report prepared for Balance Hydrologics, Inc, January 2019, 41 p + appendices.

Cultural resources investigation to support the Polaris + Pomin Wetland Restoration Feasibility Study. Preliminary screening of documented cultural resources completed by records searches. Contextual summary of regional history for the North Lake Tahoe area.

[Salix] Salix Consulting, Inc., 2019, Biological Resources and Wetlands Assessment for the ±21-Acre Polaris Creek and Wetland Study Area: report prepared for Balance Hydrologics, Inc., 39 p + appendices.

Biological and wetland resources assessment investigation to support the Polaris + Pomin Wetland Restoration Feasibility Study. Characterization of the plant, animal, and habitat types present within the Study Area, and identification of special-status or sensitive species. Mapping of habitat types for preliminary identification of wetland areas under USACE jurisdiction. Recommendations provided for future biological and wetland surveys to support the permitting process.

Shaw, D., 2008, Tahoe Environmental Research Center (TERC) Hatchery Wetland Restoration Hydrology and Soils Assessment: technical letter report prepared for Hill Planning, 9 p + enclosures.

Summary of hydrology, geomorphology, and soils information for a stream and wetland restoration project associated with the TERC Tahoe City Fish Hatchery. Discussion of the technical design basis for the restoration project.

[SIG] Spatial Informatics Group, 2015, A Review of Stream Environment Zone Definitions, Field Delineation Criteria and Indicators, Classification Systems, and Mapping – Collaborative Recommendations for Stream Environment Zone Program Updates: technical report and digital database, 62 p.

Review and update the current SEZ policy to ensure implementing ordinances and program elements are consistent with best available science and data, and support desired SEZ conditions, functions, processes and values. No changes to SEZ definitions are proposed. Changes to field indicators are proposed. Three intensities of SEZ survey and delineation are proposed to address the need for varying levels of precision in SEZ

mapping. A Tahoe basin-wide aquatic resources and SEZ map were developed based on the new delineation protocols and high-resolution data sets.

[TRPA] Tahoe Regional Planning Authority, 2019, Lake Tahoe Stream and Meadow Baseline Condition Assessment: draft report updated December 2019, 360 p + appendices.

Existing data from various agencies was compiled and supplemented with additional data collection to provide a nearly complete picture of the current health of streams and meadows in the Tahoe Basin. The SEZ assessment will be used to (1) set a baseline to track long-term changes, (2) identify restoration opportunities, (3) develop a basin-wide goal for SEZ restoration, and (4) inform the design of a long-term SEZ monitoring plan. SEZ scorecards for the summer 2019 data collection effort included portions of the Study Area for the Polaris + Pomin project and showed the major impairments to be habitat fragmentation and conifer encroachment.

Wood Rodgers, 2004, Lake Forest Erosion Control Project EIP Projects #10061 and #10063 – Existing Conditions Analysis Memorandum: report prepared for Placer County Department of Public Works, Tahoe Design Division, November 29, 2004, 73 p + enclosures.

Existing Conditions Analysis Memorandum (ECAM) to support the Lake Forest Erosion Control Project following the guidelines of "Formulating and Evaluating Alternatives for Water Quality Improvement Projects" document compiled by the Lake Tahoe Storm Water Quality Improvement Committee. The study summarized: hydrologic conditions, geomorphic conditions of streams, water quality conditions, biological resources, cultural resources, land use/capability/ownership, and other nearby projects. Opportunities and constraints analysis provided to guide future design phases.

Wood Rodgers, 2006, Lake Forest Erosion Control Project Supplemental Existing Conditions Analysis & Formulation of Alternatives Memorandum – Wildlife & Recreation Components: report prepared for Placer County, March 24, 2006, 69 p + enclosures.

Supplement to the 2004 ECAM to summarize recreation opportunities, transportation linkages, and detailed wildlife and habitat evaluations. Alternatives to improve recreation, transportation, and wildlife/habitat conditions were also compiled.

Wood Rodgers, 2007, Lake Forest Erosion Control Project Preferred Alternative Report for Area B, Lake Forest Creek and Polaris Creek Watershed: report prepared for Placer County, April 13, 2007, 37 p + enclosures.

The preferred project alternative is presented along with input from the Technical Advisory Committee for the project which informed the design. Detailed reach-by-reach descriptions are provided in preparation for the environmental documentation process. Preliminary hydrology and water quality calculations are presented to assess the feasibility of the proposed storm water features. Preliminary cost estimates, a

detailed summary of potential utility conflicts, and a general description of the proposed effectiveness monitoring strategy are also presented.

Zephyr Collaboration, 2019, Summary of Public Input, Pomin Park + Polaris Creek Project: report prepared for Tahoe Resource Conservation District, 5 p + attachments.

Summary of public outreach efforts completed to support the Polaris + Pomin Wetland Restoration Feasibility Study. Results of in-person and online surveys presented to capture public opinion on the restoration project, relocation of Pomin Park, and the receiving sites for Pomin Park.

APPENDIX E

Observer log for surface water monitoring program

Appendix E. Field Observer Log
Polaris Creek at Lake Tahoe, WY2019

Site Conditions				*Streamflow*			*Water Quality Observations*				*Remarks*
Date/Time (observer time)	Observer	Stage	Hydrograph	Measured Discharge	Instrument Used	Estimated Accuracy	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Additional sampling?	
(mm/dd/yr)		*(feet)*	*(R/F/U/B)*	*(cfs)*	*AA/PY/MMB*	*(e/g/f/p)*	*(deg C)*	*(µmhos/cm)*	*(at 25 deg C)*	*(Qbed, etc.)*	
10/8/18 14:12	pk/ds	0.39	B	0.56	PY	g	9.3	114	164	pH, DO, Sal	Gage installed. Willows beginning to leaf out. Rain over previous weekend, first rain in months. Water clear. Moderate algae on bed.
11/14/18 12:59	pk/jj	0.39	B	0.43	MMB	g	--	98	165	pH, DO, Sal	Dataloggers downloaded.
12/17/18 12:30	pk/mk	0.47	U	--	--	--	--	--	--	--	Snow on banks (~0.5'). Water clear
1/22/19 12:30	pk/mk	0.53 ±0.01	U	--	--	--	--	--	--	--	Snow on banks (~1'). Water clear
3/1/19 13:41	pk/mk	0.68 ±0.01	U	--	--	--	--	--	--	--	Deep snow (3 to 4') on banks. Water clear.
4/3/19 13:28	pk	0.77 ±0.03	U	4.98	PY	f	--	--	--	--	Deep snow (2 to 3') on banks. Gage in good condition. Water clear. No obvious HWMs, stage may be at highest since install. Light rain previous 2 days.
4/9/19 9:42	pk	0.91 ±0.03	F	9.47	MMB	g	3.5	86.0	145.0	--	Lots of snowmelt since last visit, 1 to 2' remains on banks. Rain overnight. Water clear. Side channel upstream of gage ~20% of total flow. Downloaded.
4/24/19 16:45	jj	1.04 ±0.02	U	15.58	AA	f					Snow melted out around stream. Still ~1' on snow still in athletic field. Ground saturated near stream. Water turbid, unable to see channel bed. Water flowing over parking lot.
6/22/19 19:28	ds	0.67	F	--	--	--	--	--	--	--	
7/22/19 11:26	bt	0.64	U	2.63	MMB	g	11.7	94	125	--	Lots of algae on rocks upstream of gage; tributary upstream of gage running over 1 cfs; lots of grasses and dens vegetation; upstream measurement site had low water < 1 inch deep for several feet on both sides of the main channel-measured flow doanstream near gage
10/31/19 13:50	pk	0.48	U	0.95	MMB	g	11.7	94	125	--	Water clear. Very cold weather starting ~5 days ago. Small patches of ice in channel.

Observer Key: (pk) is Peter Kulchawik, (bt) is Ben Trustman, (ds) is David Shaw, (jj) is Jack Jaquet, (mk) is Michelle Kulchawik
Stage: Water level observed at outside staff plate
Hydrograph: Describes stream stage as rising (R), falling (F), uncertain (U), or baseflow (B)
Instrument: If measured, typically made using a Marsh-McBirney (MMB), standard (AA) or pygmy (PY) bucket-wheel ("Price-type") current meter. If estimated, from rating curve (R) or visual (V).
Estimated measurement accuracy: Excellent (E) = +/- 2%; Good (G) = +/- 5%; Fair (F) = +/- 9%; Poor (P) = > 10%
High-water mark (HWM): Measured or estimated at location of the staff plate
Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance
Additional Sampling: Qbed = Bedload, Qss = Suspended sediment, Nutr = nutrients; other symbols as appropriate

APPENDIX F

Summary of Potential Regulatory Requirements for Project Elements

1.1 Summary of Potential Regulatory Requirements

The following list of potential regulatory requirements is based upon the understanding of the various project elements—restoration at Pomin Park, relocation of the athletic field, and relocation of the campground—as they are described in this feasibility study. When a more comprehensive project description is prepared some of these regulatory assumptions may not apply and others may be necessary. Also, regulations change or new regulations are adopted; sometimes with a substantive impact on a potential project (e.g., the new waters of the state Procedures or recent Executive Orders on WOUS). Therefore, this list is solely intended to provide general guidance. As alternatives are examined, costs are determined, and a final project description is developed it will be necessary to comply with those regulations, standards, and procedures that are in effect at the time a project is carried out.

Readers are reminded that the feasibility study does not make recommendations for a CEQA lead agency because it would be premature at this stage of the planning process and without a final project description. Readers are also reminded that the environmental effects of the restoration project and the development of a new recreation facilities (athletic fields and/or campground) would be evaluated as one project.

1.1.1 Polaris Creek Wetland Complex Partial or Complete Restoration

Placer County

- CEQA - Placer County's potential role as a CEQA lead agency will be determined once a complete project description is prepared.
- Discretionary approvals - A Minor Use Permit (MUP) is required for "Participant Sports Facilities" if a partial restoration and modification of the existing facilities is proposed
- Grading permit – A grading permit is required unless the exception thresholds of § 15.48.070 and 15.48.120 (G) of Placer County Code apply.
- Engineered grading plans - Grading plans are required when the project involves more than 1,500 cubic yards of material, where depth of fill exceeds 10 feet, for any substantial drainage work, for retaining walls equal to or greater than 4 feet in height, for construction of private vehicular bridges, or where otherwise required in Article 15.24, §15.48.310 of Placer County Code.

- Grading plan/permit plan check
- Placer County Storm Water Quality Design Manual – East Placer - Construction of more than 2,500 square feet of impervious surface will require low impact development storm water quality design measures.
- Preparation of a Storm Water Pollution Prevention Plan (SWPPP) for County review/approval
- Verification that a Waste Discharge Identification number (WDID) is issued by Lahontan.
- Grading plan/permit plan issuance and inspection.
- Post-project monitoring
- Restrictions on grading between October 15 and May 1 (§ 15.48.120 of Placer County Code)
- Building permit – If there are any structures, electrical, or plumbing associated with the habitat restoration project it may be necessary to obtain a building permit.
- Demolition permit – If the demolition of facilities is required a demolition permit may be required from the Building Division.

Tahoe Regional Planning Agency (TRPA)

- TRPA Environmental Documentation – Due to the scope and scale of the Project, it is highly likely that TRPA will be a lead agency for Environmental Documentation (e.g., if an Environmental Impact Statement is required for a restoration project). There are 3 possible outcomes: 1) Finding of No Significant Effect, 2) Mitigated Finding of No Significant Effect and 3) preparation of an EIS.
- Grading permit – A grading permit would be required in that a restoration project is not likely to be exempt as described by TRPA's list of Exempt/Qualified Exempt Activity thresholds.
- Land capability verification – The verification is required prior to submittal of a grading permit.
- Scenic Impact Assessment Form – The assessment form needs to be submitted as part of the grading permit.
- Preparation of an Initial Environmental Checklist or Environmental Assessment – If the project is subject to Environmental Review by TRPA it will be necessary to prepare the Initial Environmental Checklist or Environmental Assessment

- Findings - Preparation of TRPA findings explanation and rationale
- Project review – Conducted by TRPA
- Conditional Permit – Issued by TRPA and valid for three years
- Conditions of approval – It is the applicant's responsibility to satisfy conditions of approval from the Conditional Permit
- TRPA final acknowledgement of the grading permit
- Completion date – The project must be completed within two years of the date of the TRPA pre-grading inspection.

Lahontan Regional Water Quality Control Board (RWQCB)

- CEQA - Lahontan will be a responsible agency
- 401 Water Quality Certification for the USACE Nationwide Permit 27 or other USACE permit
- Compliance with Procedures for Discharges of Dredged or Fill Material to Waters of the State (to be effective on May 28, 2020) if waters of the state are present
- National Pollutant Discharge Elimination (NPDES) General Construction Permit – waste discharge requirements for land disturbances of one acre or greater (General Permit Order No. R6T-20016-0010 expires on December 31, 2021). An applicant must file a Notice of Intent (NOI) application and prepare a Storm Water Pollution Prevention Plan.
- Placer County Grading permit/plans won't be issued until the Waste Discharge Identification number is issued by Lahontan.

U.S. Army Corps of Engineers (USACE)

- NEPA lead or cooperating agency
- Wetland (WOUS) delineation conducted to USACE standards
- Provide a pre-construction notification (PCN) to the Sacramento District Engineer if WOUS are present
- Section 404 permit (Nationwide Permit 27 - Aquatic Habitat Restoration, Enhancement, and Establishment Activities) or other permit required by the Sacramento District

- Compliance with the National Historic Preservation Act (Section 106) and the State Historic Preservation Officer for cultural resource impacts.

California Department of Fish and Wildlife (CDFW)

- CEQA trustee and potential responsible agency
- Pre-construction site surveys
- Notification to CDFW if impacts are anticipated to rivers, streams and lakes
- Lake and Streambed Alteration Agreement
- Incidental take permit if required

U.S. Fish and Wildlife Service (USFWS)

- Pre-construction site surveys
- Section 7 Consultation on a CWA section 404 Nationwide 27 permit or other USACE CWA 404 permit
- Section 10 habitat conservation plan (HCP) if there is no other federal action
- Incidental take permit

California State Lands Commission (CSLC)

- Lease from CSLC for any work on State of California Sovereign Land (below elevation 6223.0 feet, Lake Tahoe Datum)
- Jurisdictional Determination from CSLC for any work within the public trust easement (between elevation 6223.0 feet and 6228.75 feet, Lake Tahoe Datum)

1.1.2 Athletic Field Relocation

Placer County

- CEQA - Placer County's potential role as a CEQA lead agency will be determined once a complete project description is prepared.
- Discretionary approvals - A Minor Use Permit is required for "Participant Sports Facilities"
- Improvement plans – Conditions of approval will typically require improvement plans addressing site improvements, storm water improvements, drainage and site grading

- Design/Site Review – new structures will require Design/Site Review by Placer County and possibly the Tahoe Basin Design Review Committee
- Placer County Storm Water Quality Design Manual – East Placer - Construction of more than 2,500 square feet of impervious surface will require low impact development storm water quality design measures.
- Building permit – If new structures are proposed or there are mechanical, electrical, or plumbing improvements a building permit will be required.
- Encroachment permit – An encroachment permit will be necessary for access to a County or State right-of-way or and any work within a County or State right-of-way.

Tahoe Regional Planning Agency (TRPA)

- TRPA Environmental Documentation – Due to the scope and scale of the Project (which would include partial or complete restoration of the Polaris Creek wetland complex), it is highly likely that TRPA will be a lead agency for Environmental Documentation.
- Grading permit required (not exempt in that the project will exceed the Exempt/Qualified Exempt Activity thresholds).
- Land capability verification prior to submittal of a grading permit.
- Preparation of a Scenic Impact Assessment Form
- Preparation of an Initial Environmental Checklist or Environmental Assessment - If the project is subject to environmental review by TRPA it will necessary to prepare the Initial Environmental Checklist or Environmental Assessment
- Findings - Preparation of TRPA findings explanation and rationale
- Project review – Conducted by TRPA
- Conditional Permit – issued by TRPA and valid for three years
- Conditions of approval - It is the applicant's responsibility to satisfy conditions of approval from the Conditional Permit
- TRPA final acknowledgement of the grading permit
- Completion date – The project must be completed within two years of the date of the TRPA pre-grading inspection.

- Design review for any structures (e.g., restroom) (TRPA Design Review Guidelines – 1989)

Lahontan Regional Water Quality Control Board (RWQCB)

- CEQA - Lahontan will be a responsible agency
- 401 Water Quality Certification for the USACE Nationwide Permit 42 or other USACE permit
- Compliance with Procedures for Discharges of Dredged or Fill Material to Waters of the State (to be effective on May 28, 2020) if waters of the state are present
- National Pollutant Discharge Elimination (NPDES) General Construction Permit – waste discharge requirements for land disturbances of one acre or greater (General Permit Order No. R6T-20016-0010 expires on December 31, 2021). Applicant must file a Notice of Intent (NOI) application and prepare a Storm Water Pollution Prevention Plan. A WDID will be issued once the NOI is submitted.
- Placer County Grading permit/plans won't be issued until the Waste Discharge Identification number is issued by Lahontan.

U.S. Army Corps of Engineers (USACE)

- NEPA lead or cooperating agency
- Provide a pre-construction notification (PCN) to the Sacramento District Engineer if WOUS are present
- Section 404 permit (Nationwide Permit 42 – Recreational Facilities) or other permit required by the Sacramento District
- Compliance with the National Historic Preservation Act (Section 106) and the State Historic Preservation Officer for cultural resource impacts.

California Department of Fish and Wildlife (CDFW)

- CEQA trustee and potential responsible agency
- Pre-construction site surveys
- Notification to CDFW if impacts are anticipated to rivers, streams and lakes
- Lake and Streambed Alteration Agreement
- Incidental take permit

U.S. Fish and Wildlife Service (USFWS)

- Pre-construction site surveys
- Section 7 Consultation on the CWA section 404 Nationwide 42 permit or other USACE CWA 404 permit
- Section 10 HCP if there is no other federal action
- Incidental take permit if required

1.1.3 CAMPGROUND RELOCATION

Placer County

- CEQA - Placer County's potential role as a CEQA lead agency will be determined once a complete project description is prepared.
- Discretionary approvals - A Conditional Use Permit (CUP) is required for a "Developed Campground".
- The "Developed Campground" land use is limited to the following Tahoe Basin Area Plan subdistricts: Tahoe Vista Residential Subdistrict, North Tahoe West Mixed-Use Subdistrict, West Shore Mixed-Use Subdistrict, Watson Creek Subdistrict, Snow Creek Subdistrict, Fish Hatchery Subdistrict, Burton Creek Subdistrict, McKinney Lake subdistrict, Upper Ward Valley Subdistrict, North Tahoe High School Subdistrict, North Tahoe Recreation Area Subdistrict, the Greater Tahoe City Mixed-Use Subdistrict.
- "Undeveloped Campgrounds" are allowed in the Lower Truckee Subdistrict, the North Tahoe High School Subdistrict, North Tahoe Recreation Area Subdistrict, Snow Creek Subdistrict, Upper Ward Valley Subdistrict,
- Improvement plans – Conditions of approval will typically require improvement plans addressing site improvements, storm water improvements, drainage and site grading
- Placer County Storm Water Quality Design Manual – East Placer - Construction of more than 2,500 square feet of impervious surface will require low impact development storm water quality design measures.
- Building permit – If new structures are proposed or there are mechanical, electrical, or plumbing improvements a building permit will be required.

- Encroachment permit – An encroachment permit will be necessary for access to a County or State right-of-way or and any work within a County or State right-of-way.

Tahoe Regional Planning Agency (TRPA)

- TRPA Environmental Documentation – Due to the scope and scale of the Project (which would include partial or complete restoration of the Polaris Creek wetland complex), it is highly likely that TRPA will be a lead agency for Environmental Documentation.
- Grading permit required (not exempt in that the project will exceed the Exempt/Qualified Exempt Activity thresholds).
- Land capability verification prior to submittal of a grading permit.
- Preparation of a Scenic Impact Assessment Form
- Preparation of an Initial Environmental Checklist or Environmental Assessment - If the project is subject to environmental review it will necessary to prepare the Initial Environmental Checklist or Environmental Assessment
- Findings - Preparation of TRPA findings explanation and rationale
- Project review – Conducted by TRPA
- Conditional Permit – issued by TRPA and valid for three years
- Conditions of approval - It is the applicant's responsibility to satisfy conditions of approval from the Conditional Permit
- TRPA final acknowledgement of the grading permit
- Completion date – The project must be completed within two years of the date of the TRPA pre-grading inspection.
- Design review for any structures (e.g., restroom) (TRPA Design Review Guidelines – 1989)

Lahontan Regional Water Quality Control Board (RWQCB)

- CEQA - Lahontan will typically be a responsible agency
- 401 Water Quality Certification for the USACE Nationwide Permit 42 or other USACE permit
- Compliance with Procedures for Discharges of Dredged or Fill Material to Waters of the State (to be effective on May 28, 2020) if waters of the state are

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- Placer County Grading permit/plans won't be issued until the Waste Discharge Identification number is issued by Lahontan.

U.S. Army Corps of Engineers (USACE)

- NEPA lead or cooperating agency
- Provide a pre-construction notification (PCN) to the Sacramento District Engineer if WOUS are present
- Section 404 permit (Nationwide Permit 42 – Recreational Facilities) or other permit required by the Sacramento District
- Compliance with the National Historic Preservation Act (Section 106) and the State Historic Preservation Officer for cultural resource impacts.

California Department of Fish and Wildlife (CDFW)

- CEQA trustee and potential responsible agency
- Pre-construction site surveys
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U.S. Fish and Wildlife Service (USFWS)

- Pre-construction site surveys
- Section 7 Consultation on the CWA section 404 Nationwide 42 permit or other USACE CWA 404 permit
- Section 10 HCP if there is no other federal action
- Incidental take permit if required