3.5 FISHERIES

This section describes existing fisheries and aquatic resources in the study area, discusses applicable regulations that govern the management of those resources, and presents an analysis of potential impacts to these resources from implementation of Alternatives 1–5.

3.5.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

The following federal laws and regulations related to fisheries are relevant to the proposed alternatives and described in detail in Chapter 5, "Compliance, Consultation, and Coordination":

- Federal Endangered Species Act
- U.S. Forest Service (USFS) Lake Tahoe Basin Management Unit
- Federal Clean Water Act
  - Section 401
  - Section 404

State

The following state laws and regulations related to fisheries are relevant to the proposed alternatives and described in detail in Chapter 5, "Compliance, Consultation, and Coordination":

- California Endangered Species Act
- California Fish and Game Code
- Porter-Cologne Water Quality Control Act

Tahoe Regional Planning Agency

Goals and Policies

Chapter IV (Conservation Element) of TRPA's Goals and Policies establishes goals for the preservation, development, utilization, and management of natural resources within the Tahoe Basin (TRPA 2004). These goals are designed to achieve and maintain adopted environmental threshold carrying capacities and are implemented through the Code of Ordinances.

The maintenance of essential habitat serves as the fisheries management emphasis for the Conservation Element of TRPA's Goals and Policies. Conservation Element/Fisheries Goal 1 is to "improve aquatic habitat essential for the growth, reproduction and perpetuation of existing and threatened fish resources in the Tahoe Basin" (TRPA 2004). For streams within the Tahoe Basin, the management focus is the quality and quantity of habitat provided for fish species including spawning and rearing habitat, food supply, and cover. The Conservation Element identifies five attainment policies related to instream fish habitat:

1. Development proposals affecting streams, lakes, and adjacent lands shall evaluate impacts to the fishery.

2. Unnatural blockages and other impediments to fish movement would be prohibited and removed wherever appropriate.

3. Habitat improvement projects in streams and lakes shall be encouraged.

4. Instream flows shall be maintained or enhanced.

5. State and federal efforts to reintroduce Lahontan cutthroat trout shall be supported.

Code of Ordinances

Chapter 63 (Fish Resources) of TRPA's Code of Ordinances (TRPA 2011) includes provisions for the protection of fish habitat and the enhancement of degraded habitat. For instream habitats, protection provisions include prohibiting stream channel alterations, facilitating fish movement at stream crossings, removing barriers to fish movement, mitigating impacts to fish habitat from development, maintaining instream flows, preventing sediment entry into the stream system, and encouraging native vegetative cover.

ENVIRONMENTAL SETTING

Aquatic Habitat in the Upper Truckee River

The reach of the Upper Truckee River within the study area is characterized by slow velocities and a low gradient (0–1 percent); the substrate is composed primarily of peat, clay, sand, and fine sediment. The channel is incised with steep banks and contains small amounts of woody material. Willows are the dominant woody riparian vegetation along the channel. This reach is dominated by pool and deep run habitats near Lake Tahoe. At high lake levels, substantial portions of the Upper Truckee River and its floodplain are submerged by Lake Tahoe and become backwater habitat (DGS and Conservancy 1997). In normal and wet years, a backbeach "lagoon" is seasonally created, developing in the spring in concert with increased river flows from snowmelt and then receding in early to midsummer as the lake level and river flow decline. Lagoon habitat may be valuable for spawning of lake-dwelling species and may provide temporary habitat for juvenile minnows or other fishes. Unfortunately, recently introduced warm-water species have also invaded this habitat and may be detrimental to its native species.

Fisheries in the Upper Truckee River

The fish community in the Tahoe Basin is affected primarily by trends related to decreased abundance of native fish species and a shift from native to introduced fish species. Both of these trends are accelerated by aquatic habitat degradation in the basin. Before the 1850s, nine native fish species occurred in the Tahoe Basin. Since that time, 20 nonnative fish species have been introduced. At present, 24 species of fish occur in the Tahoe Basin, of which 15 are found in Lake Tahoe (Table 3.5-1). The variety of fish introduced into the Tahoe Basin resulted from actions by state agencies to improve fishing or prey species, and also from ill-informed and illegal introductions from the public or anglers to establish new recreational fisheries. Most of these introductions were made without an understanding of their impact on the native fauna.

Native minnows, suckers, sculpin, and trout are still found in the Upper Truckee River and in Lake Tahoe. These native nongame species are important to the function of the stream ecosystem. Juveniles and smaller individuals may be important prey for larger trout. Some of these species have special management status and a high probability of occurrence in the study area (Table 3.5-2). The mountain sucker (*Catostomus platyrhynchus*) is a California Department of Fish and Game (CDFG) Species of Special Concern, and the Lahontan lake tui chub (*Gila bicolor pectinifer*) is a CDFG Species of Special Concern and a USFS Sensitive Species. These special management status designations encourage watershed managers to pay extra attention to the needs of these species.

Introduced trout occupy the habitats once dominated by the native Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*). Lahontan cutthroat trout, which are federally listed as threatened, were only recently reported present within the study area. Field crews from the USFS Lake Tahoe Basin Management Unit surveyed the Upper Truckee River from Lake Tahoe upstream approximately 19.3 kilometers (12 miles) in August and September 2011 as part of the USFS Basin-wide Non-game Fish Assessment. During this survey, two Lahontan cutthroat trout were captured in the river, approximately 1,000 meters (3,280 feet) upstream of the lake. Both fish were

Table 3.5-1
Fishes in the Tahoe Basin from the 1850s to 2002

Common Name	Scientific Name	Status
Native Fishes		
Minnows (Cyprinidae)		
Lahontan stream tui chub	*Gila bicolor obesa*	
Lahontan lake tui chub	*Gila bicolor pectinifer*	CSC, USFS
Lahontan redside	*Richardsonius egregious*	
Lahontan speckled dace	*Rhinichthys osculus robustus*	
Suckers (Catostomidae)		
Tahoe sucker	*Catostomus tahoensis*	
Mountain sucker	*Catostomus platyrhynchus*	CSC
Salmonids (Salmonidae)		
Lahontan cutthroat trout [1]	*Oncorhynchus clarkii henshawi*	FT
Mountain whitefish	*Prosopium williamsoni*	
Sculpins (Cottidae)		
Paiute sculpin	*Cottus beldingi*	
Introduced Fishes		
Extant		
Minnows (Cyprinidae)		
Goldfish [2]	*Carassius auratus*	
Carp[2]	*Cyprinus carpio*	
Golden shiner [2]	*Notemigonus crysoleucas*	
Sunfishes (Centrarchidae)		
Bluegill[2]	*Lepomis macrochirus*	
Largemouth bass [3]	*Micropterus salmoides*	
Smallmouth bass [3]	*Micropterus dolomieu*	
Black crappie[2]	*Pomoxis nigromaculatus*	
White crappie[2]	*Pomoxis annularis*	
Salmonidae		
Golden trout [2]	*Oncorhynchus aquabonita*	
Rainbow trout [1]	*Oncorhynchus mykiss*	
Kokanee salmon [1]	*Oncorhynchus nerka*	
Brown trout [1]	*Salmo trutta*	
Brook trout [1]	*Salvelinus fontinalis*	
Lake trout [1]	*Salvelinus namaycush*	
Livebearers (Poeciliidae)		
Mosquito fish [2]	*Gambusia affinis*	
Bullhead catfishes (Ictaluridae)		
Brown bullhead [3]	*Ictalurus nebulosus*	
Extirpated		
Salmonids (Salmonidae)		
Chinook salmon [1]	*Oncorhynchus tshawytscha*	
Bonneville cisco [1]	*Prosopium gemmiferum*	
Atlantic salmon [1]	*Salmo salar*	
Arctic grayling [2]	*Thymallus acrticus*	

Notes:
CSC = California Species of Special Concern; FT = Federally listed as threatened, USFS = U.S. Forest Service Sensitive species
[1] Planted into Lake Tahoe by the California Fish Commission, the California Department of Fish and Game, or the Nevada Fish Commission
[2] Identified in the Tahoe Basin, but not in Lake Tahoe or tributary streams
[3] Unauthorized introduction into Lake Tahoe
Sources: Dill and Cordone 1997, Schlesinger and Ramsos 2000, Moyle 2002

Table 3.5-2
Life History of Native Fishes of the Upper Truckee River

Common Name	Scientific Name	Status[1]	Potential for Occurrence	Migration	Spawning	Incubation	Habitat Preference		
							Fry	Juvenile	Adults
Minnows (Cyprinidae)									
Lahontan speckled dace	*Rhinichthys osculus robustus*		High		June–July	6 days	Warm shallow waters, between cobbles with interstitial space	Warm shallows near large rocks	Pools with abundant cover (rocks, vegetation)
Lahontan redside	*Richardsonius egregius*	CSC	High	May–June	May–August	3–6 days	Along stream margins or in backwater areas	Along stream margins or in backwater areas	High-velocity water at the heads of deep pools
Tui chub	*Gila bicolor*	CSC	High		April–July	3–6 days	Sandy bottoms or in mouths of streams with dense vegetation	Sandy bottoms with dense vegetation	Sandy bottoms with dense vegetation
Suckers (Catostomidae)									
Tahoe sucker	*Catostomus tahoensis*		High	April–May	March–June	3–6 days	Gravel riffles with a few large rocks	Shallow areas with slow currents	Pools and runs
Mountain sucker	*Catostomus platyrhynchus*	CSC	Medium		June–August		Gravel riffles above large pools	Shallow runs and pools with cover	Runs and pools, usually under cover
Salmonids (Salmonidae)									
Lahontan cutthroat trout	*Oncorhynchus clarkii henshawi*	FT	Low	April–May	April–July	6–8 weeks	Stream margins with shallow water, low flows	Rivers and lakes within the Lahontan Basin.	Primarily lakes within the Lahontan Basin but rivers are required for spawning
Mountain whitefish	*Prosopium williamsoni*		Medium	unknown	October–December	6–10 weeks	Shallow backwaters	Rivers, creeks, and lake bottom habitats in upper portions of the lake	Benthic habitats in larger rivers and lakes
Sculpins (Cottidae)									
Paiute sculpin	*Cottus beldingi*		High		May–August, peaks May–July		Gravel bottoms, crevices under rocks	Stream margins, lake margins (algae beds)	Streams (gravel substrate)

Note: CSC = California Species of Special Concern; FT = Federally listed as threatened (CDFG 2002)
Source: Moyle 2002

missing adipose fins and were determined to be hatchery fish that had been released by the Nevada Department of Wildlife (NDOW) into Lake Tahoe near Cave Rock during the summer of 2011. This is the first time that Lahontan cutthroat trout had been recorded as part of the fish assessment (Lemmers and Santora 2012). The Lahontan cutthroat trout released near Cave Rock by NDOW in 2011 were released into Lake Tahoe to provide anglers the chance to catch a native fish species that had not been available in the lake for a long time. This plant was considered experimental and for recreational purposes and not as an attempt to repopulate Lake Tahoe. NDOW's staff will evaluate the performance of Lahontan cutthroat trout released into the lake, along with angler satisfaction with the program (NDOW 2011).

When NDOW released Lahontan cutthroat trout into Lake Tahoe during the summer of 2011, no regulatory framework was in place with the U.S. Fish and Wildlife Service (USFWS)—the regulatory agency responsible for federally listed threatened species—but Lahontan cutthroat trout were shown to be present within the project area. Therefore, appropriate Federal Endangered Species Act consultation procedures must be followed before project construction activities may begin (UTRWAG 2012).

In addition to the NDOW release into Lake Tahoe in June 2011, Lahontan cutthroat trout were reintroduced into the headwaters of the Upper Truckee River at Meiss Meadows in 1989 and 1990. Since then, efforts have been underway to expand the species' habitat downstream of Meiss Meadows, including perennial tributaries within the Upper Truckee watershed (Moore 2010).

Brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) are the dominant trout species within the lower sections of the Upper Truckee River, although brook trout (*Salvelinus fontinalis*) occur as well in smaller numbers (Conservancy 2007a). The USFS Lake Tahoe Basin Management Unit manages the headwaters of the Upper Truckee River for the benefit of reintroduced Lahontan cutthroat trout as part of its wild trout program.

The Upper Truckee River Marsh provides access (migration pathway) and temporary habitat for many fish species that move from the lake to upstream segments of the river and Trout Creek for spawning. Lake-run and resident rainbow and brown trout, Paiute sculpin (*Cottus beldingi*), Lahontan redside (*Richardsonius egregius*), Lahontan stream tui chub (*Gila bicolor obesa*), Tahoe sucker (*Catostomus tahoensis*), and mountain whitefish (*Prosopium williamsoni*) are known to move from the lake to tributary streams to access upstream spawning and rearing habitats (Snider et al. 1987, Washoe Meadows State Park 1994). Shallow-water and backwater areas within the marsh are known to provide important rearing habitat for minnows and juvenile suckers; however, the utilization of marsh habitats by these species is not well documented (Conservancy 2007a).

Native aquatic invertebrates and plants are also important to the Upper Truckee River ecosystem. Aquatic mollusks have received special attention due to marked declines throughout North America. The western pearlshell mussel (*Margaritifera falcata*) is known to be a highly sensitive indicator species (Nedeau, Smith, and Stone 2005; CDFG 2011) and is known to occur within the lower reaches of the Upper Truckee River, with large aggregations occurring near the airport (Conservancy 2007b). It is not known whether it occurs in the Upper Truckee River Marsh.

Herbst (2004) sampled eight sites along the main stem of the Upper Truckee River between 1998 and 2000, using the California stream bioassessment protocols consisting of physical habitat surveys and biological sampling of benthic macroinvertebrates to acquire baseline biomonitoring data. Herbst found that anthropogenic channel disturbance increased on a downstream gradient, and the distribution of invertebrate taxa in the Upper Truckee River was related to these habitat differences. He noted a general downstream trend of a loss of diversity, sensitive organisms, and community stability.

Since 2002, several warm-water fishes—largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), and brown bullhead (*Ictalurus nebulosus*)—have appeared in Lake Tahoe and some tributary streams (Moyle 2002). Their effects on native fish and invertebrates are unknown at this time. However, these introductions usually have an adverse effect on native fishes (and possibly amphibians and invertebrates) that use warm-water habitats in Lake Tahoe and tributary streams. The Tahoe Keys appears to be the location

where most of these nonnative species first became established in the lake. These species have dispersed from there into Pope Marsh, the Upper Truckee River, and Taylor Creek. Introduced warm-water fishes are being closely monitored by USFS (USFS 2012). Eurasian watermilfoil (*Myriophyllum spicatum*) is a nonnative aquatic plant that has been introduced to Lake Tahoe and has the potential to substantially alter aquatic habitat function in favor of nonnative fish species. Studies on the distribution of this plant and potential methods that may be used to control it are ongoing. USFWS is developing an approach to control and/or remove nonnative aquatic species within the Tahoe-Truckee system to protect native species.

3.5.2 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual or scientific information and data; and regulatory standards of federal, state, and local agencies. These criteria also encompass the factors taken into account under NEPA to determine the significance of an action in terms of the context and intensity of its effects.

CEQA Criteria

Under CEQA, an alternative was determined to result in a significant effect related to fisheries and other aquatic resources if it would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS (CEQA 1);
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG and USFWS (CEQA 2); or
- interfere substantially with the movement of any native resident or migratory fish species (CEQA 3).

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative was determined to result in a significant impact related to fisheries and other aquatic resources if it would:

- substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal (TRPA 1);
- change the diversity or distribution of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects, mammals, amphibians, or microfauna) (TRPA 2);

- reduce the number of any unique, rare, or endangered species of animals (TRPA 3); or
- introduce new species of animals into an area, or result in a barrier to the migration or movement of animals (TRPA 4).

Although not used as significance criteria, effects on TRPA thresholds were evaluated, and these effects are reported in Section 4.5, "Consequences for Environmental Threshold Carrying Capacities." In developing mitigation measures for significant impacts of the project, effects on environmental thresholds of the Tahoe Regional Planning Compact were considered.

METHODS AND ASSUMPTIONS

The impact analysis for fisheries and aquatic resources examines effects of each alternative in both the short term and the long term. Short-term effects could occur over hours, days, or weeks during the active construction phase Long-term effects are the result of changes to the river channel and associated riparian corridor and include changes to habitat conditions over a period of time after the channel has been activated.

Information related to the study area and vicinity and professional experience on similar projects has been referenced and incorporated into the analysis of the river system history, existing condition, likely future conditions, and conditions expected under each action alternative. The impact analysis for fisheries and aquatic resources relies on information and analysis provided in Section 3.8, "Hydrology and Flooding" and Section 3.9, "Geomorphology and Water Quality." As discussed in Section 3.9, potential violations of the narrative turbidity standard at the low end of the nephelometric turbidity unit (NTU) range, while considered a significant impact for CEQA/NEPA/TRPA analysis for the water quality discussion in this document, would not necessarily correspond to an adverse effect on beneficial uses related to fisheries and other aquatic organisms. To evaluate effects on beneficial uses, the water quality analysis considers aesthetic values under Non-Contact Recreation Use designation in the Basin Plan (Lahontan RWQCB 1995:2-2) as the most sensitive indicator of an effect on any beneficial uses. The turbidity values that would correlate with this impairment of aesthetics-related beneficial use might not occur unless turbidity was increased beyond natural seasonal background by several orders of magnitude. This is well beyond the <10 percent increase in background turbidity standard of the Basin Plan that was used to evaluate water quality impacts in the water quality section due to the sensitivity of Lake Tahoe. Turbidity levels would also likely need to exceed the minimum aesthetic criterion to have adverse effects on other beneficial uses, including those supporting aquatic organisms. A finding of a significant unavoidable water quality impact caused by exceedance of the stringent numeric standard does not automatically correspond to an adverse condition for aquatic organisms because impairment of related beneficial uses would likely require the proposed project to elevate turbidity levels considerably further than 10 percent above background for a greater magnitude and longer duration beyond the limited area and brief period that was used for the water quality analysis. Significance of a potential impact to aquatic species was evaluated based on anticipated effects on population levels, survival rates, distribution, and habitat use.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: Channel Aggradation and Narrowing (Maximum Recreation Infrastructure)

IMPACT 3.5-1 (Alt. 1) **Short-Term Aquatic Habitat Degradation. (CEQA 1, 2, 3; TRPA 1)** *Short-term construction activities in channels could temporarily reduce aquatic habitat quality by increasing turbidity within the construction site and possibly Lake Tahoe during construction. However, as described in Environmental Commitments 5 and 6, the Conservancy would implement effective construction-phase site management plans and comply with required permits to minimize risks of water quality degradation. Although the strict turbidity standard would likely be exceeded, the expected turbidity levels would not substantially affect the fisheries or aquatic habitat. Therefore, this impact would be* ***less than significant****.*

The proposed restoration activities under Alternative 1 would include constructing eight vertical grade controls, six lateral grade controls, 1,300 feet of bank protection work, 3,890 feet of new channel, and 200 feet of river mouth, and connecting the existing Sailing Lagoon to the river and marsh. These activities would include isolating the construction sites, removing the water from the construction sites and then "rewatering" the sites. All grading, placement of lateral and vertical grade-control structures, addition of sand, gravel, or cobble, and placement of willow clumps or revegetation efforts would occur in isolated construction sites by using isolating barriers and diverting or pumping flow around the work area. The newly constructed channels would be isolated and dewatered. Before reconnection of the new channels to the active channel, the newly excavated channel segments would be flushed with water ("rewatered") to remove as much fine sediment as possible. The water would be pumped out of the downstream end of the channel segment and used for irrigation or discharged to temporary detention basins for sediment removal. Once the quality of dewatering effluent meets previously established criteria, the isolating barriers would be removed, connecting the new segment to the active channel. Pump intakes would be screened to limit the potential for the entrainment of nonnative aquatic vegetation, fish, and invertebrates during dewatering activities.

Because of the large scale of the dewatering and rewatering activities associated with these actions, there is a high risk of some discharge of sediments to active surface waters. These discharges would be likely to cause an exceedance of the very strict turbidity standards during construction and shortly thereafter as the channel adjusts.

The extent of fisheries impacts, such as behavioral changes related to turbidity and dissolved oxygen levels would be related to the extent of in-channel disturbance and best management practices in place. For Alternative 1, 3,890 feet of new channel would be created, and eight vertical grade-control structures would be installed in the existing channel. The primary effects on water quality would occur during dewatering and rewatering of construction sites for the grade control structure and during the connection of the new channel to the existing channel. With implementation of Environmental Commitment (EC) 5, "Prepare and Implement Effective Construction Site Management Plans to Minimize Risks of Water Quality Degradation and Impacts to Vegetation," and EC 6, "Obtain and Comply with Federal, State, Regional, and Local Permits," described in Table 2-6 in Chapter 2, the potential impacts would be limited in magnitude and short in duration. Although the turbidity standard would likely be exceeded, the fisheries beneficial use would not be adversely affected. Trout initiate turbidity avoidance behaviors at around 25 NTU (ENTRIX 2005). The turbidity impact is unlikely to exceed this level, except during spikes of very short duration.

With implementation of site management practices as described in EC 5 and compliance with permits as described in EC 6, turbidity would not substantially affect fisheries or aquatic habitat. Therefore, this impact would be **less than significant**.

IMPACT 3.5-2 (Alt. 1) **Stranding of Aquatic Biota from Dewatering Work Sites and Abandoning the Old Channel. (CEQA 1, 2, 3; TRPA 2, 3, 4)** *Certain construction activities—diverting streamflow from sections of the Upper Truckee River, dewatering the Sailing Lagoon, and abandoning the old channel—could result in stranding and mortality of fish and other aquatic biota, potentially including special-status species such as Lahontan cutthroat trout and Lahontan tui chub. As described in Environmental Commitment 7, the Conservancy would implement an aquatic species rescue and relocation plan that would reduce stranding and mortality of species in dewatered areas and the abandoned channel. Therefore, this impact would be* ***less than significant****.*

Alternative 1 would involve dewatering and diverting flows around in-channel work areas to construct improvements, dewatering the Sailing Lagoon to connect it with the marsh and new river channel, and dewatering and then backfilling the old channel to abandon it. All these construction activities would require temporarily dewatering the active river channel. This dewatering would cause stranding and mortality of fish and other aquatic biota. Several special-status species, including the Lahontan cutthroat trout (federally listed as threatened) and the Lahontan tui chub (a California Species of Special Concern) could be affected.

To minimize the stranding of fish and aquatic biota, however, the Conservancy would implement EC 7, "Prepare and Implement an Aquatic Species Rescue and Relocation Plan," described in Table 2-6 in Chapter 2. Under this plan, the Conservancy would retain a qualified biologist(s) to oversee rescue and relocate fish, freshwater mussels, and other important native aquatic species when flows are diverted to a new channel, and when water is pumped out of the Sailing Lagoon and diverted around in-channel construction sites. Organisms would be removed from these sites and transported and released into suitable sites that would not be or have already been restored (i.e., Lake Tahoe or sites on the Upper Truckee River). All equipment used for dewatering and fish or mussel rescue would be properly decontaminated to kill or remove all potential invasive aquatic species (i.e., Eurasian watermilfoil). All pump intakes would be screened to limit entrainment of fish and aquatic weeds (i.e., Eurasian watermilfoil). All activities would occur in compliance with TRPA's *Lake Tahoe Region Aquatic Invasive Species Management Plan*.

Implementing EC 7 would minimize stranding and mortality of aquatic biota in the project area. Therefore, this impact would be **less than significant**.

IMPACT 3.5-3 (Alt. 1) **Short-Term Disruption of Fish Passage/Migration. (CEQA 3; TRPA 2, 3, 4)** *Construction of restoration improvements may result in short-term disruption of fish passage between the Upper Truckee River and Lake Tahoe or in-river seasonal migration. The temporary fish barriers would be in place for construction for a relatively short time period that would not encompass all of the spawning season for any of the fish species. This impact would be less than significant.*

As part of Alternative 1, eight vertical grade-control structures in the existing channel and 3,890 feet of new channel would be constructed. Installation of the grade-control structures would require dewatering and routing flows around these dewatered segments in bypass channels or pipes. Dewatering and rerouting flows may obstruct fish movement within the Upper Truckee River and to Lake Tahoe. Activating the new channel section would require diverting flow around the old channel, constructing tie-ins, and filling the old channel. These actions would result in temporary barriers to fish passage.

Several species of native minnows move locally from the lake into streams for spawning in spring, and mountain suckers move locally within the stream for spawning in midsummer. The primary spawning periods for rainbow trout and Lahontan redsides—spring and early summer—coincide with snowmelt runoff. Mountain suckers are late spring and summer spawners. Mountain whitefish migrate upstream for spawning in the fall (October–December). The project could block fish passage during some of these time periods, but not all of them.

Construction would occur during low-flow conditions, and diversions would occur between August and mid-October. The temporary fish barriers would be in place for dewatering and diversions for a relatively short time period that would not encompass all of the spawning season for any of the fish species; therefore, the construction-phase impact would be **less than significant**.

IMPACT 3.5-4 (Alt. 1) **Long-Term Disruption of Fish Passage/Migration. (CEQA 1, 2, 3; TRPA 1, 2, 3)** *Alternative 1 would not result in any long-term change to fish passage or migration because the depth of flow in the restored channels would be improved and the connection between the lake and the Upper Truckee River would be sustained. This impact would be* ***less than significant****.*

Alternative 1 would not result in any long-term change to fish passage or migration. Despite the fact grade control structures would create a positive grade feature that will promote aggradation it is expected that the depth of flow in the restored channels would be sustained during this phase over the first couple years. This impact would be **less than significant**.

IMPACT 3.5-5 (Alt. 1) **Introduction and Spread of Aquatic Invasive Species by Construction Activities. (CEQA 1, 2; TRPA 1, 4)** *Aquatic invasive species (i.e., the plant Eurasian watermilfoil) are located in the Upper Truckee River and the Sailing Lagoon and could potentially be introduced and spread to the river via construction activities. Implementation of an invasive species management plan, as described in Environmental Commitment 4 and which specifically addresses invasive plant management, would substantially reduce the potential for existing aquatic invasive species to spread. Therefore, this impact would be* ***less than significant****.*

Aquatic invasive species are located in the Upper Truckee River channel and the adjacent Sailing Lagoon. The invasive aquatic plant, Eurasian watermilfoil, is a particular species of concern. Channel construction activities and connection of the Sailing Lagoon to the marsh and channel, including direct actions and aquatic species rescue and relocation, present a risk of introducing and spreading invasive species like Eurasian watermilfoil in the river. EC 4, "Prepare and Implement an Invasive Species Management Plan," described in Table 2-6 in Chapter 2 describes the development of an invasive species management plan that would substantially reduce the risk of spreading the invasive species. A qualified biologist with experience in the Tahoe Basin and aquatic invasive species would conduct a preconstruction survey to determine the type and extent of the invasive species. An eradication plan would be implemented to ensure that all aquatic species were removed before active construction. The site would be monitored for four years after construction. Any infestations documented would be treated and eradicated.

With implementation of EC 4, the risk of introduction and spread of aquatic invasive species, such as the invasive plant Eurasian milfoil, would be substantially reduced. Therefore, this impact would be **less than significant**.

Alternative 2: New Channel—West Meadow (Minimum Recreation Infrastructure)

IMPACT 3.5-1 (Alt. 2) **Short-Term Aquatic Habitat Degradation. (CEQA 1, 2, 3; TRPA 1)** *Short-term construction activities in channels could temporarily reduce aquatic habitat quality by increasing turbidity within the construction site and possibly Lake Tahoe during construction. However, as described in Environmental Commitments 5 and 6, the Conservancy would implement effective construction-phase site management plans and comply with required permits to minimize risks of water quality degradation. Although the strict turbidity standard would likely be exceeded, the expected turbidity levels would not substantially affect the fisheries or aquatic habitat. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-1 (Alt. 1). The proposed restoration activities under Alternative 2 would include constructing two vertical grade controls, six lateral grade controls, 1,300 feet of bank protection, 8,420 feet of new channel, and 51,000 square feet of river mouth, and connecting the existing Sailing Lagoon to the river and marsh. This alternative would include the same types of construction activities, techniques, and potential impacts as Alternative 1.

With implementation of ECs 5 and 6, the potential impacts would be limited in magnitude and short in duration. Although the turbidity standard would likely be exceeded, the fisheries beneficial use would not be adversely affected. Trout initiate turbidity avoidance behaviors at around 25 NTU (ENTRIX 2005). The turbidity impact is unlikely to exceed this level, except during spikes of very short duration during construction and shortly thereafter as the channel adjusts.

With implementation of site management practices as described in EC 5 and compliance with permits as described in EC 6, turbidity would not substantially affect fisheries or aquatic habitat. Therefore, this impact would be **less than significant**.

IMPACT 3.5-2 (Alt. 2) **Stranding of Aquatic Biota from Dewatering Work Sites and Abandoning the Old Channel. (CEQA 1, 2, 3; TRPA 2, 3, 4)** *Certain construction activities—diverting streamflow from sections of the Upper Truckee River, dewatering the Sailing Lagoon, and abandoning the old channel—could result in stranding and mortality of fish and other aquatic biota, potentially including special-status species such as Lahontan cutthroat trout and Lahontan tui chub. As described in Environmental Commitment 7, the Conservancy would implement an aquatic species rescue and relocation plan that would reduce stranding and mortality of species in dewatered areas and the abandoned channel. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-2 (Alt. 1). The proposed restoration activities under Alternative 2 would include constructing two vertical grade controls, six lateral grade controls, 1,300 feet of bank protection, 8,420 feet of new channel, and 51,000 square feet of river mouth, and connecting the existing Sailing Lagoon to the river and marsh. The scale of rescue and relocation of aquatic species would be greater under this alternative than under Alternative 1 because the amount of new channel created, and therefore the amount of old channel filled, would be greater. The greater area would require more rescue and relocation; however, implementing an aquatic rescue and relocation plan, as described in EC 7, would minimize stranding and mortality of aquatic species in the old channel. Under this plan, the Conservancy would retain a qualified biologist(s) to rescue and relocate fish, freshwater mussels, and other important native aquatic species when flows are diverted to a new channel, and when water is pumped out of the Sailing Lagoon and diverted around in-channel construction sites. Implementing EC 7 would minimize stranding and mortality of aquatic biota in the project area. Therefore, this impact would be **less than significant**.

IMPACT 3.5-3 (Alt. 2) **Short-Term Disruption of Fish Passage/Migration. (CEQA 3; TRPA 2, 3, 4)** *Construction of restoration improvements may result in short-term disruption of fish passage between the Upper Truckee River and Lake Tahoe or in-river seasonal migration. However, fish barriers would be in place for only a short time period that would not encompass all of the spawning season for any species. Therefore, this impact would be* ***less than significant****.*

Alternative 2 would involve constructing two vertical grade controls, six lateral grade controls, 1,300 feet of bank protection, 8,420 feet of new channel, and 51,000 square feet of river mouth, and connecting the existing Sailing Lagoon to the river and marsh. The fish barriers would be in place for only a short time period that would not encompass all of the spawning season of any of the fish species. This impact would be **less than significant**.

IMPACT 3.5-4 (Alt. 2) **Long-Term Disruption of Fish Passage/Migration. (CEQA 1, 2, 3; TRPA 1, 2, 3)** *Alternative 2 would not result in any long-term change to fish passage or migration because a key element of this alternative is the excavation of a new river channel and the replacement of the existing river mouth with a new river mouth similar in size to the historical river mouth prior to dredging. This alternative also includes all other restoration and enhancement elements of Alternative 1. This impact would be* ***less than significant****.*

Alternative 2 would not result in any long-term change to fish passage or migration. This alternative would restore the river channel and its connection to the floodplain while maintaining the connection between the lake and the Upper Truckee River. This impact would be **less than significant**.

IMPACT 3.5-5 (Alt. 2) **Introduction and Spread of Aquatic Invasive Species by Construction Activities. (CEQA 1, 2; TRPA 1, 4)** *Aquatic invasive species (i.e., the plant Eurasian watermilfoil) are located in the Upper Truckee River and the Sailing Lagoon and could potentially be introduced and spread to the river via construction activities. Implementation of an invasive species management plan, as described in Environmental Commitment 4, and which specifically addresses invasive plant management, would substantially reduce the potential for existing aquatic invasive species to spread. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-5 (Alt. 1). The project involves construction activities in areas (Upper Truckee River and the Sailing Lagoon) where known aquatic invasive species are present. The invasive aquatic plant Eurasian watermilfoil is a particular species of concern. These activities present a risk of further introduction and spreading. With implementation of EC 4, the risk of introduction and spread of aquatic invasive species, like Eurasian watermilfoil, would be substantially reduced. Therefore, this impact would be **less than significant**.

Alternative 3: Middle Marsh Corridor (Moderate Recreation Infrastructure)

IMPACT 3.5-1 (Alt. 3) **Short-Term Aquatic Habitat Degradation. (CEQA 1, 2, 3; TRPA 1)** *Short-term construction activities in channels could temporarily reduce aquatic habitat quality by increasing turbidity within the construction site and possibly Lake Tahoe during construction. However, as described in Environmental Commitments 5 and 6, the Conservancy would comply with required permits and implement effective construction-phase site management plans to minimize risks of water quality degradation. Although the strict turbidity standard would likely be exceeded, the expected turbidity levels would not substantially affect the fisheries or aquatic habitat. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-1 (Alt. 2). The proposed restoration activities under Alternative 3 would include constructing multiple vertical grade controls, three lateral grade controls, at least 1,300 feet of bank protection, and 1,500 feet of new pilot channel, and connecting the existing Sailing Lagoon to the river and marsh. This alternative would include the same types of construction activities, techniques, and impacts as Alternative 1.

With implementation of ECs 5 and 6, the potential impacts would be limited in magnitude and short in duration. Although the turbidity standard would likely be exceeded, the fisheries beneficial use would not be adversely affected. Trout initiate turbidity avoidance behaviors at around 25 NTU (ENTRIX 2005). The turbidity impact is unlikely to exceed this level, except during spikes of very short duration.

With implementation of site management practices as described in EC 5 and compliance with permits as described in EC 6, turbidity would not substantially affect fisheries or aquatic habitat. Therefore, this impact would be **less than significant**.

IMPACT 3.5-2 (Alt. 3) **Stranding of Aquatic Biota from Dewatering Work Sites and Abandoning the Old Channel. (CEQA 1, 2, 3; TRPA 2, 3, 4)** *Certain construction activities—diverting streamflow from sections of the Upper Truckee River, dewatering the Sailing Lagoon, and abandoning the old channel—could result in stranding and mortality of fish and other aquatic biota, potentially including special-status species such as Lahontan cutthroat trout and Lahontan tui chub. As described in Environmental Commitment 7, the Conservancy would implement an aquatic species rescue and relocation plan that would reduce stranding and mortality of species in dewatered areas and the abandoned channel. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-2 (Alt. 1). The proposed restoration activities under Alternative 3 would include constructing multiple vertical grade controls, three lateral grade controls, at least 1,300 feet of bank protection, and 1,500 feet of new pilot channel, and connecting the existing Sailing Lagoon to the river and marsh. This alternative would include the same types of construction activities, techniques, and impacts as Alternative 1.

The scale of rescue and relocation of aquatic species would be greater under this alternative than under Alternative 1 and less than under Alternative 2. Implementing an aquatic rescue and relocation plan, as described in EC 7, would minimize stranding and mortality of aquatic species in the old channel. Under this plan, the Conservancy would retain a qualified biologist(s) to rescue and relocate fish, freshwater mussels, and other important native aquatic species when flows are diverted to a new channel, and when water is pumped out of the Sailing Lagoon and diverted around in-channel construction sites. Implementing EC 7 would minimize stranding and mortality of aquatic biota in the project area. Therefore, this impact would be **less than significant**.

IMPACT 3.5-3 (Alt. 3) **Short-Term Disruption of Fish Passage/Migration. (CEQA 3; TRPA 2, 3, 4)** *Construction of restoration improvements may result in short-term disruption of fish passage between the Upper Truckee River and Lake Tahoe or in-river seasonal migration. However, fish barriers would be in place for only a short time period that would not encompass all of the spawning season for any species. Therefore, this impact would be* ***less than significant****.*

Alternative 3 would involve constructing multiple vertical grade controls, three lateral grade controls, at least 1,300 feet of bank protection, and 1,500 feet of new pilot channel, and connecting the existing Sailing Lagoon to the river and marsh. This alternative would include the same types of construction activities, techniques, and impacts as Alternative 1. The temporary fish barriers would be in place for dewatering and diversions for a relatively short time period that would not encompass all of the spawning season for any of the fish species; therefore, the construction-phase impact would be **less than significant**.

IMPACT 3.5-4 (Alt. 3) **Long-Term Disruption of Fish Passage/Migration. (CEQA 1, 2, 3; TRPA 1, 2, 3)** *Use of the pilot channel to convey flow into small channels that cross the marsh to reenter the Upper Truckee River upstream of the mouth at Lake Tahoe may result in long-term disruption of fish passage between the Upper Truckee River and Lake Tahoe. Additionally, the alternative could generate natural barrier beach processes at the mouth of the river that could seasonally close off the river from the lake. This impact would be* ***potentially significant****.*

Fish passage between Lake Tahoe and the Upper Truckee River could be impeded in the absence of a defined main channel or channels across the marsh connecting the river mouth to the upstream river. Many species of fish, including rainbow trout, mountain whitefish, and Lahontan redsides, use the existing river channel as a migration corridor from the lake to spawning habitat in the river. Rainbow trout and Lahontan redsides are spring spawning fish, so it is likely that they would continue to successfully move into the Upper Truckee River for spawning purposes. Additionally, Lahontan redsides are not obligate river spawning fish and can spawn along lakeshore areas with gravel and larger substrates. Mountain whitefish, on the other hand, are large fish and fall spawners and would not successfully be able to move upstream into the Upper Truckee River during low fall flows. Mountain whitefish live for five to ten years. Passage impairments under Alternative 3 would be significant if the duration of impairment would equal or exceed the minimum life span of a species, thereby affecting reproductive success of an entire cohort (age group) of whitefish. If flow were not contained within a sufficiently deep and defined channel, mountain whitefish would not be successful in gaining access to the river for a several years into the future. A defined low-flow channel or channels would likely form after a few years, allowing sufficient passage through the river.

During spring or winter flow events, when flow is routed through the pilot channel onto the meadow, juvenile and adult fish moving downstream during these periods would be at risk of being stranded on the marsh surface. These conditions would persist until a channel or channels have formed to reconnect the river to the lake. Because of uncertainties about the period of time required for formation of a channel suitable for upstream fish passage and downstream dispersal, this alternative has the potential to disrupt whitefish migrations for a substantial number of migration seasons, and it would increase the risk from stranding for downstream moving fish in the river. Therefore, the long-term impact on these fish populations in the Upper Truckee River and from Lake Tahoe would be **potentially significant**.

Given the design of Alternative 3 (i.e., natural formation of channels downstream of the proposed "pilot channel"), guaranteed fish passage would not be possible in the long term. Construction of a low-flow channel suitable for fish passage through the upper marsh would not be consistent with the objective of Alternative 3 to reestablish naturally dynamic channel/floodplain processes in the upper marsh.

In addition to the barriers likely created by the undefined channels, there is a chance that the mouth of the Upper Truckee River and/or Trout Creek may close off to the lake at times as a result of natural barrier beach processes. Such a barrier has been built up in the past during periods of time (months, seasons, or even years) when the

balance of flows and energy from the land/marsh side was low relative to the width of the beach ridge and the height and energy of the lake's wave action. Complex interactions may occur in the future, especially given the underlying trends of beach erosion and the potential counteracting effects from climate change. It is not possible to predict the locations, duration, or extent of potential river or creek mouth closures throughout the future life of the project. This impact would be **potentially significant**.

Because the intent and purpose of this alternative is to restore natural river/marsh processes, alterations to the design (construction of a dominant single thread channel) or future management actions (artificially maintaining passage to the lake) would negate and contradict the intention of this alternative mitigation would not be possible. Therefore, this impact would be **significant and unavoidable**.

IMPACT 3.5-5 (Alt. 3) **Introduction and Spread of Aquatic Invasive Species by Construction Activities. (CEQA 1, 2; TRPA 1, 4)** *Aquatic invasive species (i.e., Eurasian watermilfoil) are located in the Upper Truckee River and the Sailing Lagoon and could potentially be introduced and spread to the river via construction activities. Implementation of an invasive species management plan, as described in Environmental Commitment 4 and which specifically addresses invasive plant management, would substantially reduce the potential for existing aquatic invasive species to spread. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-3 (Alt. 1). The project involves construction activities in areas (Upper Truckee River and the Sailing Lagoon) where known aquatic invasive species are present. The invasive aquatic plant, Eurasian watermilfoil, is a particular species of concern. These activities present a risk of further introduction and spreading. With implementation of EC 4, the risk of introduction and spread of aquatic invasive species, such as the invasive aquatic plant Eurasian watermilfoil, would be substantially reduced. Therefore, this impact would be **less than significant**.

Alternative 4: Inset Floodplain (Moderate Recreation Infrastructure)

IMPACT 3.5-1 (Alt. 4) **Short-Term Aquatic Habitat Degradation. (CEQA 1, 2, 3; TRPA 1)** *Short-term construction activities in channels could temporarily reduce aquatic habitat quality by increasing turbidity within the construction site and possibly Lake Tahoe during construction. However, as described in Environmental Commitments 5 and 6, the Conservancy would implement effective construction-phase site management plans and comply with required permits to minimize risks of water quality degradation. Although the strict turbidity standard would likely be exceeded, the expected turbidity levels would not substantially affect the fisheries or aquatic habitat. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-1 (Alt. 1). Under Alternative 4, no grade or lateral control structures would be constructed and the existing Sailing Lagoon would not be connected to the river and marsh; however, improvements would include constructing 1,300 feet of bank protection and 2,400 feet of new channel and excavating inset floodplain along the upstream portion of the river. Construction activities, techniques, and impacts of this alternative would be similar to those of Alternative 1.

With implementation of ECs 5 and 6, the potential impacts would be limited in magnitude and short in duration. Although the turbidity standard would likely be exceeded, the fisheries beneficial use would not be adversely affected. Trout initiate turbidity avoidance behaviors at around 25 NTU (ENTRIX 2005). The turbidity impact is unlikely to exceed this level, except during spikes of very short duration.

With implementation of site management practices as described in EC 5 and compliance with permits as described in EC 6, turbidity would not substantially affect fisheries or aquatic habitat. Therefore, this impact would be **less than significant**.

IMPACT 3.5-2 (Alt. 4) **Stranding of Aquatic Biota from Dewatering Work Sites and Abandoning the Old Channel. (CEQA 1, 2, 3; TRPA 2, 3, 4)** *Certain construction activities—diverting streamflow from sections of the Upper Truckee River, dewatering the Sailing Lagoon, and abandoning the old channel—could result in stranding and mortality of fish and other aquatic biota, potentially including special-status species such as Lahontan cutthroat trout and Lahontan tui chub. As described in Environmental Commitment 7, the Conservancy would implement an aquatic species rescue and relocation plan that would reduce stranding and mortality of species in dewatered areas and the abandoned channel. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-2 (Alt. 1). Under Alternative 4, no grade or lateral control structures would be constructed and the existing Sailing Lagoon would not be connected to the river and marsh; however, improvements would include constructing 1,300 feet of bank protection and 2,400 feet of new channel and excavating inset floodplain along the upstream portion of the river. Construction activities, techniques, and impacts of this alternative would be similar to those of Alternative 1.

Implementing an aquatic rescue and relocation plan, as described in EC 7, would minimize stranding and mortality of aquatic species in the old channel. Under this plan the Conservancy would retain a qualified biologist(s) to rescue and relocate fish, freshwater mussels, and other important native aquatic species when flows are diverted to a new channel, and when water is pumped out of the Sailing Lagoon and diverted around in-channel construction sites. Implementing EC 7 would minimize stranding and mortality of aquatic biota in the project area. Therefore, this impact would be **less than significant**.

IMPACT 3.5-3 (Alt. 4) **Short-Term Disruption of Fish Passage/Migration. (CEQA 3; TRPA 2, 3, 4)** *Construction of restoration improvements may result in short-term disruption of fish passage between the Upper Truckee River and Lake Tahoe or in-river seasonal migration. However, fish barriers would be in place for only a short time period that would not encompass all of the spawning season for any species. Therefore, this impact would be* ***less than significant****.*

Under Alternative 4, no grade or lateral control structures would be constructed and the existing Sailing Lagoon would not be connected to the river and marsh; however, improvements would include constructing 1,300 feet of bank protection and 2,400 feet of new channel and excavating inset floodplain along the upstream portion of the river. Construction activities, techniques, and impacts of this alternative would be similar to those of Alternative 1. Because the temporary fish barriers would be in place for only a relatively short time period that would not encompass all of the spawning season for any of the fish species, this impact would be **less than significant**.

IMPACT 3.5-4 (Alt. 4) **Long-Term Disruption of Fish Passage/Migration. (CEQA 1, 2, 3; TRPA 1, 2, 3)** *Alternative 4 would not result in any long-term change to fish passage or migration because the depth of flow in the restored channels would be improved and the connection between the lake and the Upper Truckee River would be sustained. This impact would be* ***less than significant****.*

Alternative 4 would not result in any long-term change to fish passage or migration. The depth of flow in the restored channels would be improved and the connection between the lake and the Upper Truckee River would be sustained. This impact would be **less than significant**.

IMPACT 3.5-5 (Alt. 4) **Introduction and Spread of Aquatic Invasive Species by Construction Activities. (CEQA 1, 2; TRPA 1, 4)** *Aquatic invasive species (i.e., Eurasian watermilfoil) are located in the Upper Truckee River and could potentially be introduced and spread to the river via construction activities. Implementation of an invasive species management plan, as described in Environmental Commitment 4 and which specifically addresses invasive plant management, would substantially reduce the potential for existing aquatic invasive species to spread. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.5-5 (Alt. 1). The invasive aquatic plant, Eurasian watermilfoil, is a particular species of concern. Under Alternative 4, no grade or lateral control structures would be constructed, and the existing Sailing Lagoon would not be connected to the river and marsh; however, improvements would include constructing 1,300 feet of bank protection and 2,400 feet of new channel and excavating inset floodplain along the upstream portion of the river. Construction activities, techniques, and impacts of this alternative would be similar to those of Alternative 1. However, the impact of this alternative would much less than that of the other alternatives because the Sailing Lagoon would not be connected to the river and marsh. With implementation of EC 4 which addresses invasive plant management, the risk of introduction and spread of aquatic invasive species such as Eurasian watermilfoil would be substantially reduced. Therefore, this impact would be **less than significant**.

Alternative 5: No-Project/No-Action

IMPACT 3.5-1 (Alt. 5) **Short-Term Aquatic Habitat Degradation. (CEQA 1, 2, 3; TRPA 1)** *No construction activities would occur under Alternative 5 that could temporarily cause habitat degradation. Thus, **no impact** would occur.*

In the absence of restoration efforts, the existing degraded habitat conditions in the Upper Truckee River channel and marsh would persist. Bank erosion would result in the transport of fine sediments, which act as a stressor to aquatic biota through effects on physiology (e.g., gill abrasion), food consumption, and quality of spawning habitat. However, Alternative 5 would not include construction activities that could temporarily cause additional habitat degradation, as described for Alternatives 1–4. Consequently, **no impact** would occur.

IMPACT 3.5-2 (Alt. 5) **Stranding of Aquatic Biota from Dewatering Work Sites or Abandoning the Old Channel. (CEQA 1, 2, 3; TRPA 2, 3, 4)** *There would be no construction-related stranding of aquatic biota from Upper Truckee River habitats. **No impact** would occur.*

No restoration, recreation infrastructure, or public access features would be constructed under Alternative 5; therefore, this alternative would not cause stranding of aquatic biota. **No impact** would occur.

IMPACT 3.5-3 (Alt. 5) **Short-Term Disruption of Fish Passage/Migration. (CEQA 3; TRPA 2, 4)** *Channel restoration would not occur and there would be no disruption of fish passage or migration activity in the Upper Truckee River. **No impact** would occur.*

No restoration, recreation infrastructure, or public access features would be constructed under Alternative 5; therefore, this alternative would not disrupt fish passage. **No impact** would occur.

IMPACT 3.5-4 (Alt. 5) **Long-Term Disruption of Fish Passage/Migration. (CEQA 1, 2, 3; TRPA 1, 2, 3)** *Alternative 5 would not result in any change to fish passage or migration conditions because no construction would take place. **No impact** would occur.*

No restoration, recreation infrastructure, or public access features would be constructed under Alternative 5; therefore, this alternative would not disrupt fish passage. **No impact** would occur.

IMPACT 3.5-5 (Alt. 5) **Introduction and Spread of Aquatic Invasive Species by Construction Activities. (CEQA 1, 2; TRPA 1, 4)** *No construction activities would occur under Alternative 5 that could potentially result in introduction and spread of aquatic invasive species, such as the invasive aquatic plant Eurasian watermilfoil, to the river. **No impact** would occur.*

No restoration, recreation infrastructure, or public access features would be constructed under Alternative 5; therefore, this alternative would not result in the introduction or spread of aquatic invasive species to the Upper Truckee River as a result of project-related activities, however other vectors will continue to contribute to the spread of invasive species. **No impact** would occur.

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3.6 GEOLOGY AND SOILS, MINERAL RESOURCES, AND LAND CAPABILITY AND COVERAGE

This section discusses the regulatory guidance and existing conditions in the study area for earth resources, and evaluates potential environmental effects related to geology, soils, mineral resources, and land capability and coverage associated with project implementation. Potential environmental effects related to water quality resulting from soil erosion and other stormwater issues are addressed in Section 3.9, "Geomorphology and Water Quality." Cumulative geologic impacts are addressed in Section 3.18, "Cumulative Impacts." Consistency with TRPA goals and policies is presented in Section 3.10, "Land Use," Table 3.10-1. The project's effects on thresholds are described in Section 4.5, "Consequences for Environmental Threshold Carrying Capacities."

3.6.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

The Earthquake Hazards Reduction Act is relevant to the proposed alternatives and is described in detail in Chapter 5, "Compliance, Consultation, and Coordination."

State

The following state laws and regulations related to geologic resources are relevant to the proposed alternatives and are described in detail in Chapter 5, "Compliance, Consultation, and Coordination":

- California Surface Mining and Reclamation Act of 1975
- Alquist-Priolo Earthquake Fault Zoning Act
- Seismic Hazards Mapping Act

Tahoe Regional Planning Agency

Goals and Policies

The following goals and policies in Chapter II (Land Use Element) of TRPA's Goals and Policies (TRPA 2006) related to land use are applicable to this analysis. (Text that is not relevant to the project has been omitted from some of the following goals and policies.)

- **Land Use Goal 3:** All new development shall conform to the coefficients of allowable land coverage as set forth in "The Land Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide for Planning, Bailey, 1974." This goal calls for policies which limit allowable impervious land coverage associated with new development. These policies set allowable land coverage by applying the recommended Bailey land coverage coefficients to specifically defined and related areas. In some instances, provisions are made to allow additional coverage by transfer. The transfer programs shall operate by a direct offset method. In addition, land capability is one of the basic factors in determining the suitability of lands for development and appropriateness of land uses.

    - **Policy 1:** Allowed base land coverage for all new projects and activities shall be calculated by applying the Bailey coefficients, as shown below, to the applicable area within the parcel boundary, or as otherwise set forth in A, B, and C of this policy. [The policy provides a table of maximum allowed land coverage for each land capability district, ranging from one percent for Land Capability Districts (LCDs) 1a, 1b, 1c, and 2 to 30 percent for Land Capability District 7.]

- **Policy 2:** The allowed coverage in Policy 1 may be increased by transfer of land coverage within hydrologically related areas up to the limits as set forth in A, B, C, D, and F of this policy [described in the Goals and Ordinances, but not provided in this EIR/EIS/EIS]:

    - Land coverage may be transferred through programs that are further described in Goal #3 of the development and implementation priorities subelement.

    - The intent of the land coverage transfer programs is to allow greater flexibility in the placement of land coverage within hydrologically related areas. Such programs include the use of land banks, lot consolidation, land coverage restoration programs, and transfer programs based on the calculation of land coverage on non-contiguous parcels located in hydrologically related areas. The coverage transfer programs allow for coverage over base coverage to be permitted and still be consistent with the soils threshold and Goal #3 of this Subelement.

- **Policy 3:** Rehabilitation, reconstruction, and upgrading of the existing inventory of structures, or other forms of coverage in the Tahoe Region, are high priorities of the regional plan. To encourage rehabilitation and upgrading of structures, the following policies shall apply:

    B. Reconstruction, rehabilitation, modification, relocation, or major repair of structures or coverage other than as specified in A may be allowed, provided such use is allowed under the land use subelement, Goal #2, Policies 8, 9, and 10. For parcels with existing coverage in excess of the Bailey Coefficients, a land coverage mitigation program shall be set by ordinance, which shall provide for the reduction of coverage in an amount proportional to the cost of the repair, reconstruction, relocation, rehabilitation, or modification, and to the extent of excess coverage. [Policy 3.B then lists the minimum options available to property owners to accomplish these reductions.]

    C. Existing coverage may be relocated within a parcel provided it is relocated to areas of equal or superior environmental capability consistent with B above.

    E. In approving repair, reconstruction, rehabilitation, modification, or relocation of structures or other coverage, the Agency shall also apply other relevant standards, including installation of Best Management practices or compliance with the design review guidelines.

- **Natural Hazards Policies, Goal 1:** Risks from natural hazards (e.g., flood, fire, avalanche, earthquake) will be minimized.

    - **Policy 2:** Prohibit construction, grading, and filling of lands within the 100-year floodplain and in the area of wave run-up except as necessary to implement the goals and policies of the plan. Require all public utilities, transportation facilities, and other necessary public uses located in the 100-year flood plain and area of wave run-up to be constructed or maintained to prevent damage from flooding and to not cause flooding.

The following goals and policies in Chapter IV (Conservation Element) of TRPA's Goals and Policies (TRPA 2004) related to soil productivity and stream environment zones (SEZs) are applicable to this analysis:

- **Soils, Goal 1: Minimize Soil Erosion and the Loss of Soil Productivity:** Protection of the Region's soil is important for maintaining soil productivity and vegetative cover and preventing excessive sediment and nutrient transport to the streams and lakes. Soil protection is especially critical in the Basin where the soils are characteristically shallow and highly susceptible to erosion. Strategies for soil conservation are consistent with thresholds established for soil, water, and vegetation.

- **Policy 1:** Allowable impervious land coverage shall be consistent with the threshold for impervious land coverage. The Land Use Subelement (see Goal 4) establishes policies which limit impervious land coverage consistent with the impervious land coverage limits set forth in the "Land-Capability Classification of the Lake Tahoe Basin, California-Nevada, a Guide for Planning", Bailey, 1974.

- **Policy 2:** No new land coverage or other permanent disturbance shall be permitted in Land Capability Districts 1-3 except for those uses as noted in … B … below:

  B. Public outdoor recreation facilities may be permitted in Land Capability Districts 1–3 if: (1) The project is a necessary part of a public agency's long range plans for public outdoor recreation; (2) The project is consistent with the recreation element of the Regional Plan; (3) The project, by its very nature must be sited in Land Capability Districts 1–3; (4) There is no feasible alternative which avoids or reduces the extent of encroachment in Land Capability Districts 1–3; (5) The impacts are fully mitigated; and (6) Land Capability Districts 1-3 lands are restored in the amount of 1.5 times the area of Land Capability Districts 1–3 which is disturbed or developed beyond that permitted by the Bailey coefficients. To the fullest extent possible, recreation facilities must be sited outside of Land Capability Districts 1–3. However, the six-part test established by the policy allows encroachment of these lands where such encroachment is essential for public outdoor recreation, and precautions are taken to ensure that such lands are protected to the fullest extent possible. The restoration requirements of this policy can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

- **Policy 4:** TRPA shall develop specific policies to limit land disturbance and reduce soil and water quality impacts of disturbed areas. Like impervious surfaces, disturbed and compacted areas result in increased soil loss and surface runoff. The Regional Plan sets policies designed to reduce existing surface disturbance and avoid new disturbance (see Water Quality Subelement, Goal 1, Policies 2 and 3; Vegetation Subelement, Goal 1, Policy 5). TRPA shall set guidelines defining "disturbance" and determine what types of disturbed and compacted areas should be counted as impervious surfaces for purposes of applying land coverage limits. Coverage limits shall not be applied so as to prevent application of best management practices to existing disturbed areas.

- **Policy 6:** Grading, filling, clearing of vegetation (which disturbs soil), or other disturbances of the soil are prohibited during inclement weather and for the resulting period of time when the site is covered with snow or is in a saturated, muddy, or unstable condition. Special regulations and construction techniques will apply to all construction activities occurring between October 15 and May 1. Impacts related to soil disturbance are highly exaggerated when the soil is wet. For precautionary reasons, all project sites must be adequately winterized by October 15 as a condition for continued work on the site. Exceptions to the grading prohibitions will be permitted in emergency situations where the grading is necessary for reasons of public safety or for erosion control.

- **Policy 7:** All existing natural functioning SEZs shall be retained as such and disturbed SEZs shall be restored whenever possible. Stream environment zones shall be managed to perpetuate their various functional roles, especially pertaining to water cleansing and nutrient trapment. This requires enforcement of a non-degradation philosophy. This policy is common to the Water Quality, Vegetation, Stream Environment Zone, and Wildlife Subelements and will be implemented through the Land Use Element and capital improvements program.

► **Stream Environment Zone, Goal 1: Provide for the Long-Term Preservation and Restoration of Stream Environment Zones.** The preservation of SEZs is a means for achieving numerous environmental thresholds. Policies that promote their maintenance, protection, and restoration are listed below.

- **Policy 1:** Restore all disturbed stream environment zone lands in undeveloped, unsubdivided lands, and restore 25 percent of the SEZ lands that have been disturbed, developed, or subdivided.

- **Policy 2:** SEZ lands shall be protected and managed for their natural values. SEZ lands and associated riparian vegetation are scarce in the Basin relative to other plant communities. Because SEZs provide many beneficial functions (especially pertaining to water quality) only forest management practices, stream improvement programs, and habitat restoration projects are permissible uses.

- **Policy 5:** No new land coverage or other permanent land disturbance shall be permitted in stream environment zones except for those uses as noted in A, C, and E below:

  A. Public outdoor recreation facilities are permissible uses in stream environment zones if: (1) The project is a necessary part of a public agency's long range plans for public outdoor recreation; (2) The project is consistent with the recreation element of the regional plan; (3) The project, by its very nature, must be sited in a stream environment zone; (4) There is no feasible alternative which would reduce the extent of encroachment in stream environment zones; (5) The impacts are fully mitigated; (6) Stream environment zone lands are restored in the amount of 1.5 times the area of stream environment zone which is disturbed or developed by the project. To the fullest extent possible, recreation facilities must be sited outside of stream environment zones. Some recreation facilities, such as river access points or stream crossings for hiking trails, by their very nature require some encroachment of stream environment zones. However, the six-part test established by this policy allows encroachment of SEZs where such encroachment is essential for public outdoor recreation and precautions are taken to ensure that stream environment zones are protected to the fullest extent possible. The restoration requirements of this policy can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

  B. Public service facilities are permissible uses in stream environment zones if: (1) The project is necessary for public health, safety, or environmental protection; (2) There is no reasonable alternative, including spans, which avoids or reduces the extent of encroachment in stream environment zones; (3) The impacts are fully mitigated; and (4) Stream environment zone lands are restored in the amount of 1.5 times the area of stream environment zone which is disturbed or developed by the project. Development within stream environment zones is not consistent with the goal of managing stream environment zones for their natural qualities and shall generally be prohibited except under extraordinary circumstances involving public works. Each circumstance shall be evaluated based on the conditions of this policy. The restoration requirements of this policy can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

  C Projects which require access across stream environment zones to otherwise buildable sites are permissible in SEZs if: (1) There is no reasonable alternative, which avoids or reduces the extent of encroachment in the SEZ; (2) The impacts are fully mitigated; and (3) SEZ lands are restored in the amount of 1.5 times the area of stream environment zone which is disturbed or developed by the project. The restoration requirements can be accomplished on-site or off-site, and shall be in lieu of any coverage transfer or coverage mitigation provisions elsewhere in this Plan.

  E. Stream environment zone restoration projects and erosion control projects.

- **Policy 6:** Replacement of existing coverage in stream environment zones may be permitted where the project will reduce impacts on stream environment zones and will not impede restoration efforts. Existing structures in stream environment zones may be repaired or rebuilt. Minor reconstruction may be permitted so long as drainage improvements, protection of the stream environment zone from disturbances, or other measures are carried out which provide a net benefit to the area's capacity to serve as a naturally-

functioning stream environment zone. Major reconstruction or replacement may also be permitted if there is a net benefit to the stream environment zone and if the replacement or reconstruction is consistent with stream environment zone restoration programs (see Policy 1).

Code of Ordinances

The "Site Development" and "Resource Management and Protection" sections of the TRPA Code of Ordinances (TRPA 2011, adopted 2012) contain the following chapters and sections with requirements applicable to the proposed alternatives related to geology, soils, and land coverage:

- Chapter 30, "Land Coverage," regulates implementation of the land capability system, land capability districts, land coverage, and transfer and mitigation of land coverage. Section 30.5 discusses prohibitions on installation of new land coverage or other permanent disturbances within areas assigned to LCDs 1, 2, or 3 (see "Tahoe Regional Planning Agency Land Coverage Regulations" below for a discussion of LCDs). Exceptions to these prohibitions exist for single-family dwellings that are subject to review under the individual parcel evaluation system, qualifying public outdoor recreation facilities, and qualifying public facilities (e.g., water quality control facilities, including erosion control projects; habitat restoration projects; wetland rehabilitation projects; and SEZ restoration projects). Section 30.6 discusses exceptions for coverage relocation requirements that allow for a 1:1 coverage relocation ratio for the Upper Truckee River and Marsh Restoration Project. Further exceptions are related to bridges and boardwalks that may be accounted for at a lesser coverage ratio requirement.

- Section 33.3, "Grading Standards," regulates excavation, filling, and clearing to avoid adverse effects related to exposed soils, unstable earthworks, or groundwater interference. Section 33.3 specifically addresses seasonal limitations, winterization techniques, discharge prohibitions, dust control, disposal of materials, standards for cuts and fills, and excavation limitations.

- Section 33.4, "Special Information Reports and Plans," regulates the need for special investigations, reports, and plans determined to be necessary by TRPA to protect against adverse effects from grading, including potential effects on slope stability, groundwater or antiquities.

- Section 33.5, "Grading and Construction Schedules," regulates schedules for grading and construction when those activities are anticipated to occur pursuant to a TRPA permit. Section 33.5.1 specifies, "For projects presenting special problems with regard to project completion, site development, or water quality management, such as crossings of stream environment zones, major earthworks, or major clearing projects, TRPA may require, as a condition of approval, submittal and approval of project schedules prior to site disturbance."

- Section 33.6, "Vegetation Protection during Construction," regulates the requirements for protection of vegetation and soil during construction activities. Section 33.6 specifically addresses protection of vegetation not designated and approved for removal, limits on size, type, and location of equipment use, and revegetation of disturbed areas.

- Chapter 35, "Natural Hazard Standards," regulates activities to prevent damage to property and protect public health relating to natural hazards.

- Section 60.4, "Best Management Practice Requirements," sets forth the requirements for installation of best management practices (BMPs) for the protection or restoration of water quality and attainment of minimum discharge standards. BMPs, as described in the *Handbook of Best Management Practices* (Volume II of the *Lake Tahoe Basin Water Quality Management Plan*), or equivalent practices approved by TRPA, will be applied to all public and privately owned lands. In addition to the standard requirements of Section 60.4.6, the project conditions of approval will list any other appropriate required BMPs to meet minimum discharge

standards. Construction in SEZs or Land Capability Districts 1–3, inclusive, normally will require special conditions of approval because of the sensitivity of those areas to disturbance.

Cove East Litigation Settlement Agreement

Several parcels within the study area are included as part of a litigation settlement agreement. Coverage allocations for these parcels, shown in Exhibit 3.6-1, replace the Bailey System in this defined portion of the study area.

Article 5, Section 5.2 of the litigation settlement for the west side of the study area allocates 550,148 square feet of "DilDev Net Coverage," by total land area rather than by land capability district (People of the State of California, ex rel. John K. Van de Kamp, Attorney General of the State of California v. Dillingham Development Company and Tahoe Regional Planning Agency [Superior Court, County of El Dorado CIV-S-85-0873-EJG]). 441,963 square feet of the 550,148 is available on Conservancy property. Table 3.6-1 summarizes the assignment of this coverage to parcels.

Table 3.6-1
Settlement Assigned Coverage

Parcel	Assessor's Parcel Number (APN)	Approximate Acreage	Assigned Coverage (Square Feet)
Parcel 3 – State Portion (Conservancy):	APN 022-210-41	.7	0
Parcel 3 – Remainder (Tahoe Keys Marina-owned):[1]	APN 022-210-40	5.7	108,185
Parcel 4 (Conservancy):	APN 022-210-46, 48, 50	58.9[2]	380,108
Parcel 5 (Conservancy):	APN 022-210-37	142.8	61,855

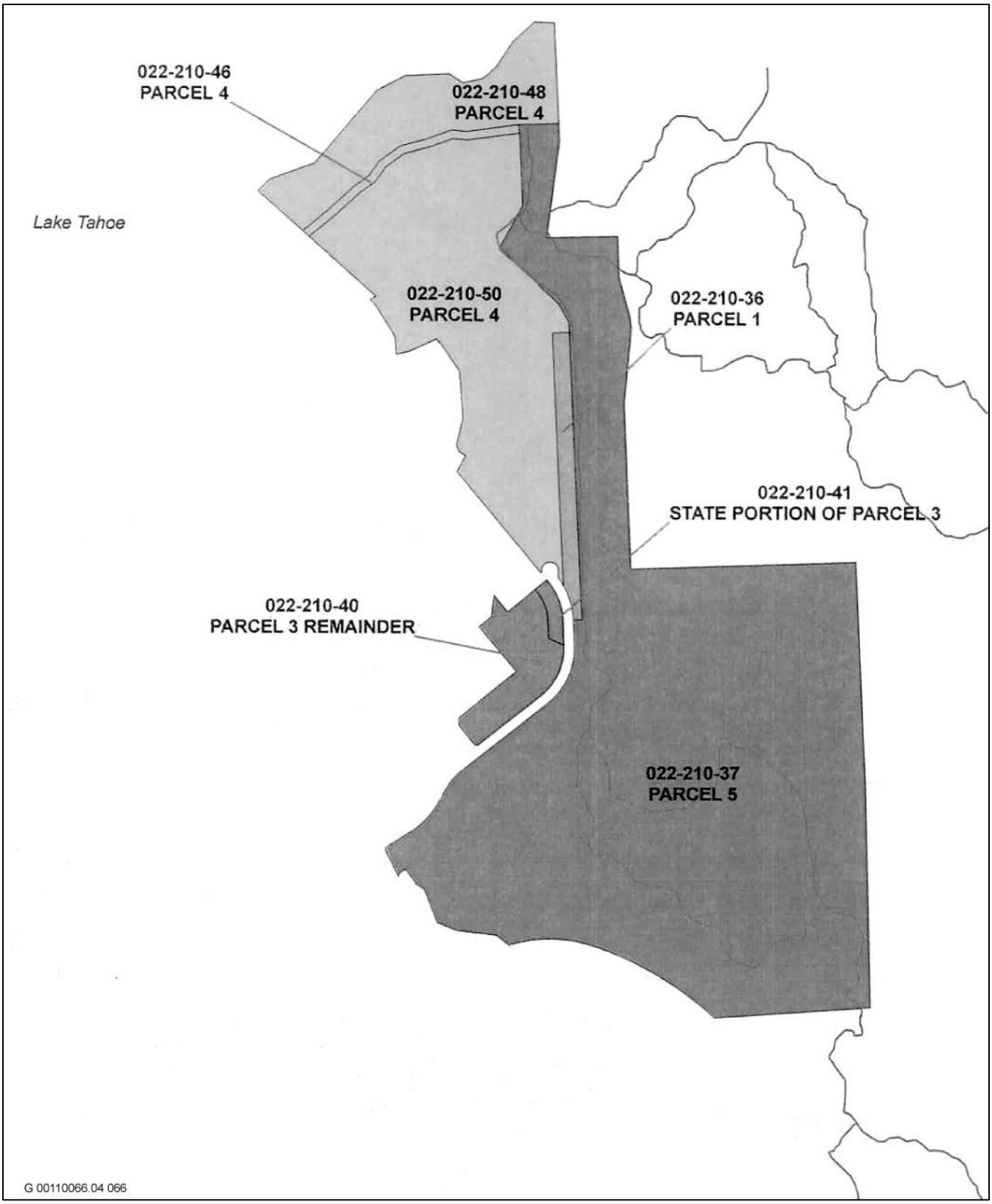
Notes:
[1] - Parcel 3 – Remainder is not within the study area.
[2] - Acreage includes areas mapped as waterbodies within parcel 4.
Source: People of the State of California, ex rel. John K. Van de Kamp, Attorney General of the State of California v. Dillingham Development Company and Tahoe Regional Planning Agency (Superior Court, County of El Dorado CIV-S-85-0873-EJG)

The settlement also sets the rules governing transfers of this coverage with respect to the settlement area (Section 5.3 of the settlement). The "settlement area," defined in Exhibit 7 of the settlement, includes the above properties, as well as properties owned by Tahoe Keys Property Owners Association (TKPOA) and the Conservancy's Parcel 1. The settlement provides for the transfer of coverage between parcels located in the settlement area, through recordation of appropriate coverage transfer instruments, without further discretionary approvals (while transfers of this "allowable" coverage to projects outside the settlement area must be carried out in conformance with the Regional Plan).

Coverage changes proposed in these parcel use the values and transfer mechanisms defined in this litigation settlement as described in the environmental consequences section below.

Land Capability Districts

Since 1972, TRPA has used the Bailey System (a land capability classification system) to evaluate applications that request either additional impervious land coverage to existing developed lots or building permits for new development (Bailey 1974). The Bailey System was developed to mitigate the deleterious effects on stream systems and water quality that result from excessive coverage of land by impervious surfaces. The Bailey System restricts the amount of impervious land coverage on all parcels and generally prohibits new land coverage in areas classified as SEZ.



Source: Conservancy 2012

Exhibit 3.6-1 **Dillingham Parcel Map**

Land capability is defined as "the level of use an area can tolerate without sustaining permanent (environmental) damage through erosion and other causes" (Bailey 1974). The Bailey system uses LCDs ranging from 1 to 7, which assign a percentage of land coverage allowable in the designated LCD area (see Table 3.6-2).

Table 3.6-2
Capability Districts for Tahoe Basin Lands

Capability Levels	Maximum Allowable Coverage (%)	Tolerance for Use	Slope Percent[1]	Relative Erosion Control	Runoff Potential[2]	Disturbance Hazards
7	30	Most	0–5		Low to moderately low	Low-hazard lands
6	30		0–16	Slight	Low to moderately low	
5	25		0–16		Moderately high to high	
4	20		9–30	Moderate	Low to moderately low	Moderate-hazard lands
3	5		9–30	Moderate	Moderately high to high	
2	1		30–50	High	Low to moderately low	
1a	1	Least	30+	High	Moderately high to high	High-hazard lands
1b	1		(Poor Natural Drainage)			
1c	1		(Fragile Flora and Fauna)[3]			

[1] Most slopes occur within this range. There may be, however, small areas that fall outside the range given.
[2] Low to moderately low - hydrologic-soil groups A and B; moderately high to high - hydrologic-soil groups C and D.
[3] Areas dominated by rocky and stony land.
Source: Data compiled by EDAW (now AECOM) from Bailey 1974

LCDs were derived by analyzing the land capability according to frequency and magnitude of hazards that might be encountered and by considering the type and intensity of uses suitable for each unit (Bailey 1974). Capability classes are expressed as levels of tolerance that a unit can withstand without sustaining permanent damage through erosion or other causes (i.e., water quality or land productivity). The integration of the LCDs and land use suitability resulted in limits on land-surface modifications for each unit. The limits are expressed as a percentage of each area that can be used for impervious coverage.

Chapter 90 of the TRPA Code of Ordinances defines land coverage as a human-made structure, improvement, or covering that prevents normal precipitation from directly reaching the surface of the land underlying the structure, improvement, or covering (TRPA 2008). Examples include roofs, decks, patios, and surfaces paved with asphalt, concrete, or stone. Such structures are defined as "hard coverage." Areas of compacted soils without structures are defined as "soft coverage" (e.g., areas where parking of cars or heavy pedestrian traffic have compacted soils to an extent that prevents substantial infiltration of water).

City of South Lake Tahoe

Chapter 36 of the City of South Lake Tahoe (CSLT) Code, Grading, Erosion, and Sediment Control Ordinance was codified for the following purposes:

- Regulating grading on both public and private property within the CSLT to safeguard life, limb, health, property and public welfare;

- To avoid pollution of watercourses with hazardous materials, nutrients, sediments, or other earthen materials generated on or caused by surface runoff or by aerial deposition of pollutants generated from the permit area on or across the permit area; and

- To ensure that the intended use of a graded site is consistent with the CSLT general plan, any specific plans adopted thereto and applicable CSLT ordinances including the zoning ordinance, flood damage prevention ordinance, environmental review ordinance, and applicable chapters of the California Building Code.

In the event of conflict between these ordinances and state or federal law, these ordinances shall prevail unless preempted by the state or federal law.

Unless in conflict with provisions of adopted general and/or specific plans, the following grading may be done without obtaining a grading permit from the CSLT (only relevant grading activities are listed):

- Grading activities governed and operating under permits issued by TRPA or Lahontan regional or state water boards or Caltrans;

- Stream restoration or alteration projects conducted under valid regional, state or federal permits, e.g., stream alteration permits, water quality certifications, etc.

ENVIRONMENTAL SETTING

Regional Geology

The Tahoe Basin is located in the northern Sierra Nevada, between the Sierra crest to the west and the Carson Range to the east. The Sierra Nevada is the most prominent mountain range in California, and in conjunction with the Central Basin, forms part of the Sierra Nevada microplate, an element of the broad Pacific–North American plate boundary (Argus and Gordon 1991). Before becoming part of the transform plate margin, the Sierra Nevada was the site of a Cenozoic volcanic arc, with related deposits draping over pre-Cenozoic metamorphic and plutonic rocks (Wakabayashi and Sawyer 2000:173). The general asymmetry of the Sierra Nevada reflects uplift and gentle westward tilting, evidenced by the mountain range sloping gently westward and abruptly eastward from its crest to west of the study area.

The Tahoe Basin was formed more than two million years ago by a combination of faulting and volcanism. As a result, the basin contains a combination of granitic, metamorphic, and volcanic rock. The predominant bedrock in the basin is Cretaceous granodiorite of the Sierra Nevada batholith. Cretaceous rock formed during the later period of the Mesozoic Era, characterized by the development of flowering plants and ending with the sudden extinction of dinosaurs and many other forms of life. Pre-Cretaceous metamorphic rocks are found in localized areas. Over the past 1.5 million years, the Tahoe region has been altered by glacial activity. During this activity, valley glaciers dammed the Truckee River Canyon, raising the water level of Lake Tahoe. Lacustrine sediments were deposited in the bays and canyons around the lake as a result of the rising lake levels. The faulting, folding, and in some cases overturning of rock formations that have taken place during various periods of geologic activity, in combination with erosion, deposition, and subsequent cementation of rock materials that have occurred during relatively quiet periods, have left a complex arrangement of geologic rock types and structures in the area. However, the extraordinary clarity of Lake Tahoe is related to the prevalence of resistant granitic bedrock in the Tahoe Basin and an unusually small drainage basin relative to the size of the lake.

Local Geology and Topography

The study area is located on the South Lake Tahoe, California, 7.5-minute U.S. Geological Survey quadrangle map. Elevations are approximately 6,228–6,245 feet above mean sea level, and the study area slopes gently toward the lake (to the north).

A review of the Geologic Map of the Lake Tahoe Basin indicates that most of the study area (approximately 80 percent) is composed of Holocene-age floodplain deposits, composed of silty sand and sandy to clayey silt (Saucedo 2005). Approximately ten percent of the study area, immediately adjacent to and north of the Highland Woods subdivision, is composed of Pleistocene-age lacustrine terrace deposits, composed of silt, sand, and gravel and forming broad, low terraces at 16–32 feet above lake level. The remaining ten percent of the study area, which includes the Lower West Side Restoration Area, is composed of late Holocene artificial fill, human-made deposits of varying composition.

Seismicity

The potential for seismic activity at a given location is most often related to the proximity of faults, fractures, or zones of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side. Most faults are the result of repeated displacement that can take place suddenly or by slow creep, or both.

The study area is located along the southern shore of Lake Tahoe on a regionally significant down-faulted graben (i.e., trench-like geologic feature), sometimes referred to as a half-graben. The study area is not located in an Alquist-Priolo Earthquake Fault Zone (California Geological Survey [CGS] 2005, Hart and Bryant 1999). The nearest fault zoned under the Alquist-Priolo Act is near Minden, Nevada, approximately 20 miles from the study area. The Geologic Map of the Lake Tahoe Basin, California and Nevada, shows that several faults mapped near the study area (Saucedo 2005).The North Tahoe Fault, located beneath the lake, is a northeast-southwest trending fault, approximately 7.0 miles long. The northeast-southwest trending Incline Village Fault zone appears to be the landward extension of the submerged North Tahoe Fault and also trends northeast toward the Truckee Meadows Fault. All three of these faults may be part of a system of normal faults that rupture together. Evidence indicates that an earthquake may have occurred along the Incline Village Fault as recently as 500 years ago, and all three faults are estimated to be capable of generating an earthquake of magnitude 7.0 (Seitz and Kent 2004).

The East Tahoe Fault, much of which is also located under Lake Tahoe, is inferred to bound the east margin of the basin (Sawyer 1999). The fault shows bedding terminating against a planar west-dipping bedrock surface, suggesting young movement. Recent bathymetry of Lake Tahoe reveals that the escarpment is deeply dissected, has an irregular base, and is partly buried at the base by well-developed sediment aprons. The subaqueous fault has probably been modified by the deposition of thick debris avalanche deposits, appearing to have accumulated against the eastern basin escarpment after one or more very large debris avalanches that initiated on the west wall of the basin. Schweickert et al. (2000) speculated that at least one megalandslide on the west side of the basin was triggered by a Holocene faulting event. No evidence has been reported that the East Tahoe Fault displaces Quaternary deposits on the north or south shores of the lake.

The north-south trending West Tahoe-Dollar Point Fault zone is another prominent normal slip fault zone in the Tahoe Basin (Ichinose et al. 1999). The West Tahoe Fault is submerged from Emerald Bay to McKinney Bay. The Dollar Point Fault is the northern continuation of the West Tahoe Fault northward from McKinney Bay. Both of these faults are likely to rupture together.

According to the Earthquake Potential Map for Portions of Eastern California and Western Nevada, the Tahoe area is considered to have a relatively low to moderate potential for shaking caused by seismic-related activity (CGS 2005).

Estimates of the peak ground acceleration have been made for the Tahoe Basin based on probabilistic models that account for multiple seismic sources. Under these models, consideration of the probability of expected seismic events is incorporated into the determination of the level of ground shaking at a particular location. The CGS has estimated the expected peak horizontal acceleration (with a ten percent chance of being exceeded in the next 50 years) generated by any of the seismic sources potentially affecting the study area as 0.275. (CGS 2003). The Nevada Seismological Laboratory catalog lists eight earthquakes with Richter magnitudes (M) of 4.2 or greater

that have occurred since 1950, within approximately 18 miles of the center of Lake Tahoe. These include an M 4.5 earthquake (at Tahoe Vista, approximately 40 miles northwest of the study area) on June 3, 2004. The 2004 event has been attributed to an increase in upper crustal seismicity following a deep dike swarm of 1,611 earthquakes in the Tahoe Vista area, at the site of a deep magma injection event beneath Lake Tahoe (Smith et al. 2004:1278).

Minerals

The study area does not contain any state-designated Mineral Resources Zones, according to maps prepared by the State Mining and Geology Board (Busch 2001). The site is underlain by silt, silty sand, sandy to clayey silt, sand and gravel, and artificial fill of varying composition. No economically viable deposits of clean sand or gravel exist that would be useful to extract for riprap, aggregate, or other industrial uses.

Soils

Soil profile formation within the study area is a result of the interplay of geomorphic and hydrologic processes, vegetation, and in situ chemical processes. A significant amount of heterogeneity exists within the study area because of these processes, and the general trends are described below.

The following descriptions are qualitative summaries of soil types based on the *Soil Survey for the Lake Tahoe Basin Area* (NRCS 2007).

- Beaches (Soil Unit 7011)
- Tahoe complex, 0 to 2 percent slopes (Soil Unit 7041)
- Tahoe complex, 0 to 5 percent slopes gravelly (Soil Unit 7042)
- Tahoe mucky silt loam, drained, 0 to 5 percent slopes (Soil Unit 7043)
- Oxyaquic Xerorthents-Water association, 0 to 5 percent slopes (Soil Unit 7051)
- Watah peat, 0 to 2 percent slopes (Soil Unit 7071)
- Christopher-Gefo complex, 0 to 5 percent slopes (Soil Unit 7444)
- Marla loamy coarse sand, 0 to 5 percent slopes (Soil Unit 7471)

Beaches—This soil type is located at the shoreline area of Lake Tahoe and consists of shallow fine gravels, coarse gravels, and cobbles. The soils have rapid permeability, low shrink-swell potential, and very low water capacity. The erosion hazard is slight, and this soil type has limitations for roads and excavations.

Tahoe Complex, 0 to 2 percent slopes—This soil type is located in the southern part of the Tahoe Basin, within flood plains and valley flats. Soils consist of mucky silt loam, gravelly coarse sand, loam, sandy loam, and loamy sand. This soil type is subject to flooding, is naturally poorly drained, has low shrink-swell potential, and has a very high runoff potential. This soil type has limitations for road construction, excavations, and dwellings.

Tahoe Complex, 0 to 5 percent slopes, gravelly—This soil type is located in riparian corridors all around the Tahoe Basin, within flood plains and valley flats. The soils are derived from granitic and volcanic parent material and consist of mucky gravelly silt loam, gravelly loam, gravelly loamy fine sand, and gravelly fine sand. This soil type is occasionally subject to flooding, is naturally poorly drained with moderate permeability, has low shrink-swell potential, and has a very high runoff potential. This soil type has limitations for road construction, excavation, and dwellings.

Tahoe mucky silt loam, drained, 0 to 5 percent slopes—This soil type is located in the southern part of the Tahoe Basin, within floodplains and valley flats. The soils are derived from granitic and volcanic parent material and consist of mucky silt, loam, loamy fine sand, and fine sand. This soil type occasionally is subject to flooding, is very poorly drained with moderate permeability, has low shrink-swell potential, and has a very high runoff potential. This soil type has limitations for road construction, excavation, and dwellings.

Oxyaquic Xerorthents-Water association, 0 to 5 percent slopes—This soil type is located in the Tahoe Keys and consists of marshland fill. The fill material is derived from granodiorite parent material and consists of very gravelly coarse sand, mucky silt loam, mucky silt loam, gravelly coarse sand, and mucky silt loam. This soil type typically is subject to flooding, is well drained with slow permeability, has low shrink-swell potential, and has a high runoff potential. This soil type has limitations for excavation and dwellings.

Watah peat, 0 to 2 percent slopes—This soil type is located in the southern part of the Tahoe Basin, in fens, flood plains, and valley flats. Soils consist of peat, mucky peat, mucky gravelly coarse sandy loam, and gravelly loamy coarse sand. The soil has moderate permeability, has low shrink-swell potential, is very poorly drained, and has very high surface runoff potential. Flooding and ponding occur frequently in this soil type. It has limitations for road construction, excavation, and dwellings.

Christopher-Gefo complex, 0 to 5 percent slopes—This soil type is located in the southern part of the Tahoe Basin, within hill slopes and outwash terraces. The soils consist of loamy coarse sand to gravelly loamy coarse sand. The soil has moderate permeability, has low shrink-swell potential, is very poorly drained, and has very high surface runoff potential. Flooding and ponding occur frequently in this soil type. The wind erosion hazard is moderate. This soil type has limitations for excavations.

Marla loamy coarse sand, 0 to 5 percent slopes—This soil type is located in the southern part of the Tahoe Basin, in outwash terraces and valley flats. Soils consist of loamy coarse sand, clay loam, stratified sandy loam, and fine sandy loam. The soil has slow permeability, has low shrink-swell potential, is poorly drained, and has very high surface runoff potential. Flooding is rare but ponding does occur in this soil type. The wind erosion hazard is moderate. This soil type has limitations for road construction, excavations, and dwellings.

Land Capability and Existing Coverage

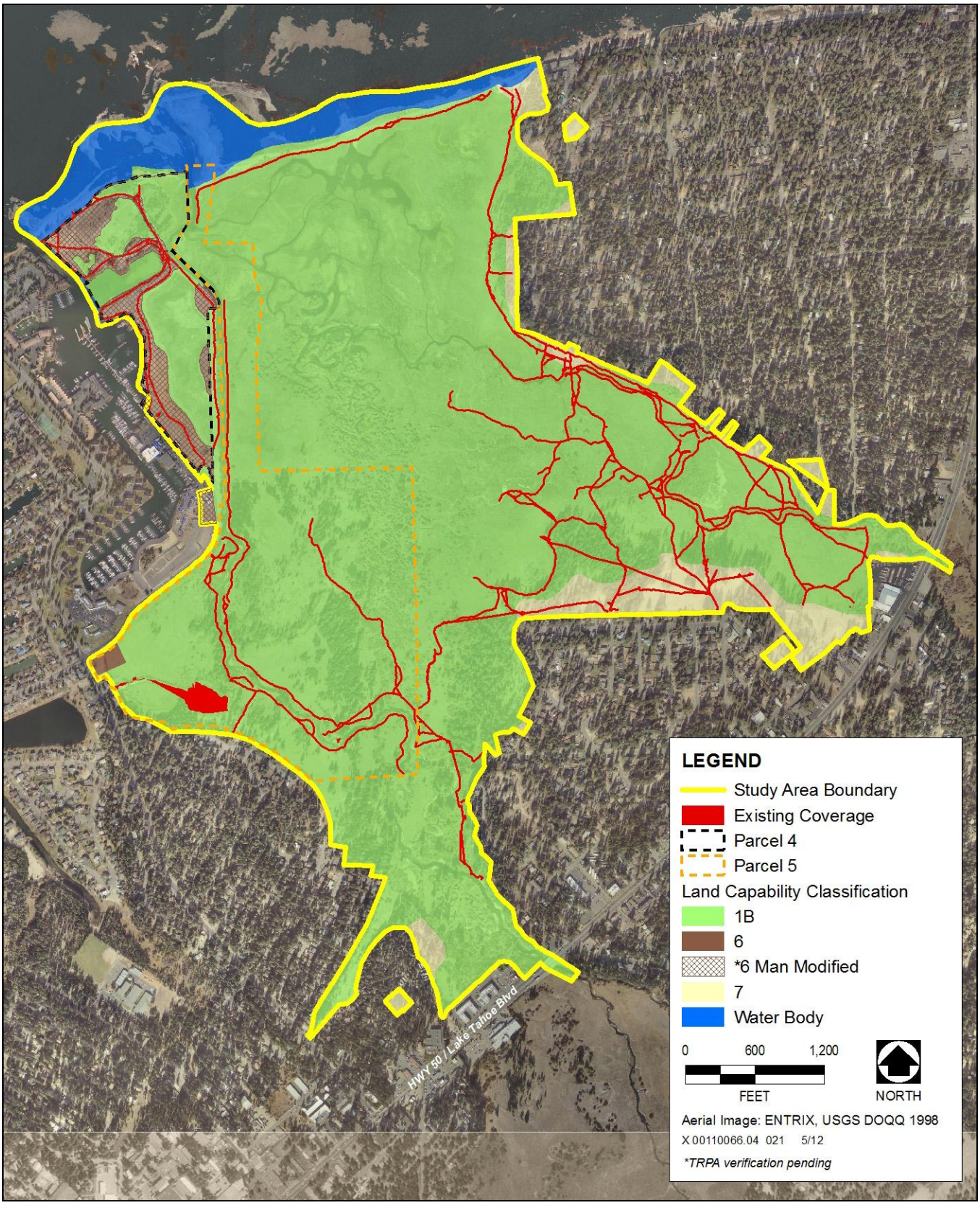
The majority of the study area has been verified as LCD 1b. There is a small area on the west edge of the study area within LCD 6 and several small areas within LCD 7 along the eastern and southern study area boundary (Exhibit 3.6-2). Table 3.6-3 presents the distribution of land coverage area in the study area within each land class as verified in the TRPA Verification of August 28, 2008. The table also shows coverage allowed within each land class. Allowable land coverage on Parcels 3, 4, and 5 is not based on land class but instead based on a litigation settlement agreement in *People of the State of California vs. Dillingham Development Company and TRPA* CIV-S-85-0873-EJG (1988) as described in the regulatory section above and summarized in Table 3.6-1.

Existing coverage within the study area includes a user-created network of trails (see Section 3.13, "Recreation," for additional discussion on trails within the study area), a few small discrete sites, and the TKPOA Corporation Yard, most of which is located within LCD 1b. The TKPOA Corporation Yard and associated entrance consists of a compacted fill and gravel base. Two outbuildings are located within the yard. Most trails within the study area consist of compacted native soil, vary in width and length, and are not maintained as designated trails, with the exception of the trail at the Lower West Side restoration area. The Lower West Side trail is composed of compacted decomposed granite and is maintained by the Conservancy.

3.6.2 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual or scientific information and data; and regulatory standards of Federal, State, and local agencies. These criteria also encompass the factors taken into account under NEPA to determine the significance of an action in terms of the context and intensity of its effects.



Source: TRPA 2012

Exhibit 3.6-2 **Land Capability and Existing Coverage of the Study Area**

Table 3.6-3
Existing Land Area, Land Capability, and Land Coverage Calculations for the Study Area

Parcel/Land Class	Gross Area (square feet)	TRPA Verified Existing Coverage (square feet)	Coverage Allowed On site (square feet)
Parcel 3 – State Portion:			
Subtotal	23,510	NC	0[1]
Parcel 4:			
1b	1,072,450	3,416	
6	749,232	34,484	
Subtotal	1,821,680	37,900	380,108[1]
Parcel 5:			
1b	6,045,756	102,290	
6	43,522	0	
Subtotal	6,089,278	102,290	61,855[1]
Other Parcels[2]:			
1b	19,497,708	60,745	194,977
7	946,896	13,006	284,069
Subtotal	18,675,816	73,751	479,046
Total	**28,364,346**	**184,911**	**921,009**

Notes:
NC Not completed.
[1] Allowable coverage is based on a litigation settlement agreement in *People of the State of California vs. Dillingham Development Company and TRPA* CIV-S-85-0873-EJG (February 25, 1988). The coverage allowed on Parcels 3, 4, and 5 is a combined total that can be used on any of the parcels.
[2] Other Parcels includes all parcels outside of parcels 3, 4 and 5 within the study area. No coverage changes are proposed for private parcels under any alternatives.
Source: Data compiled by AECOM from TRPA 2008 coverage verification and litigation settlement agreement referenced above.

CEQA Criteria

Under CEQA, an alternative was determined to result in a significant effect related to geology, soils, or mineral resources if it would:

- expose people or structures to potential substantial adverse effects including loss or injury from seismic hazards, including earthquake, fault rupture, strong seismic ground shaking, liquefaction, or landslides (CEQA 1);
- result in substantial soil erosion or loss of topsoil (CEQA 2);
- be located on a geologic unit that is unstable or would become unstable as a result of the project (CEQA 3);
- be located on expansive soil (CEQA 4);
- have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available (CEQA 5);

- result in the loss of availability of known mineral resources that would be of future value to the State or the region (CEQA 6); or

- would directly or indirectly destroy a unique paleontological resource or site (CEQA 7). An individual vertebrate fossil specimen may be considered unique or significant if it is identifiable and well preserved, and it meets one of the following criteria:

    - a type specimen (i.e., the individual from which a species or subspecies has been described);

    - a member of a rare species;

    - a species that is part of a diverse assemblage (i.e., a site where more than one fossil has been discovered) wherein other species are also identifiable, and important information regarding life history of individuals can be drawn;

    - a skeletal element different from, or a specimen more complete than, those now available for its species; or

    - a complete specimen (i.e., all or substantially all of the entire skeleton is present).

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis. NEPA requires documentation and discussion of any beneficial effects of a project in addition to its negative impacts. Where appropriate, these beneficial effects are discussed and called out specifically for the purposes of NEPA in the following impact analysis.

TRPA Criteria

The TRPA Land Classification System (Tables 3.6-2 and 3.6-3) is used to analyze potential impacts on sensitive slope, soils, and drainage conditions. Significance criteria used in the analysis of land coverage relate directly to the TRPA Land Classification System and coverage requirements as well as the litigation settlement agreement in *People of the State of California vs. Dillingham Development Company and TRPA* CIV-S-85-0873-EJG (1988) as described in the regulatory section above.

Based on TRPA's Initial Environmental Checklist, an alternative would result in a significant impact on geology, soils, and coverage if it would:

- result in a change in the topographic features of the site inconsistent with the natural surrounding conditions (TRPA 1);

- change the undisturbed soil or native geologic substructures or grading in excess of five feet (TRPA 2);

- continue or increase wind or water erosion of soils (TRPA 3);

- result in changes in siltation, deposition, or erosion that could modify the channel of a river or stream or the bed of a lake (TRPA 4);

- compact or cover soil with impervious surfaces beyond the limits allowed in the land capability districts (TRPA 5);

- expose people or property to seismic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards (TRPA 6); or

- be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse (TRPA 7).

Geologic hazards, as defined in this section, relate to seismic activity and may include surface fault rupture, strong seismic ground shaking, liquefaction, subsidence, landslides, tsunami, and seiche potential. Tsunami and seiches are addressed in Section 3.8, "Hydrology and Flooding." Nonseismic geologic hazards are discussed with regard to potential impacts on the alteration of the land surface (naturally or through human actions), including grading, deposition or erosion, landslides, avalanche, or any effects that are because of or that may alter soil properties or geotechnical issues. Although landslides, mudslides, avalanches, and other geomorphological events can be triggered by seismic activity, such activity is not necessarily a prerequisite. Therefore, they are addressed separately unless site-specific conditions warrant otherwise.

Although not used as significance criteria, effects on TRPA thresholds were evaluated and these effects are reported in Section 4.5, "Consequences for Environmental Threshold Carrying Capacities." In development of mitigation measures for significant impacts of the project, effects on environmental thresholds of the Tahoe Regional Planning Compact were considered.

METHODS AND ASSUMPTIONS

Impacts associated with geology, soils, mineral resources, and coverage that could result from project construction and operational activities were evaluated qualitatively based on expected construction practices, materials, and locations and the duration of project construction and related activities; relevant site-specific reports; a field visit; the alternatives description in Chapter 2, "Project Alternatives"; and a review of published geologic literature, including maps, books, and journal articles.

The impact analysis for earth resources also relies on information and analysis provided in Section 3.8, "Hydrology and Flooding" and Section 3.9, "Geomorphology and Water Quality." As discussed in Section 3.9, "Geomorphology and Water Quality," potential violations of the narrative turbidity standard, while considered a significant impact for CEQA/NEPA/TRPA analysis for the water quality discussion in this document, would not necessarily correspond to an adverse effect on beneficial uses. This is also true for effects on soils. Turbidity levels would also likely need to exceed the minimum aesthetic criterion to have adverse effects on soils. A finding of a significant unavoidable water quality impact does automatically correspond to an adverse condition on soils, because impairment of related beneficial uses would likely require the proposed project to elevate turbidity levels considerably more than ten percent above background for a larger magnitude and longer duration beyond the limited area and brief period used for the water quality analysis.

The 2008 verified TRPA coverage information and the TRPA Land Classification System (Tables 3.6-2 and 3.6-3) and coverage requirements required under the Bailey System or outlined in the Cove East litigation Settlement Agreement were used to analyze potential impacts on coverage, soils, and sensitive slopes. For each alternative, the anticipated change in coverage was calculated by subtracting from existing coverage the square footage that would be restored to pervious surface, and adding the square footage of impervious surface associated with the restoration, recreation infrastructure, and public access elements of that alternative. Coverage by parcel and LCD of elements of each alternative is presented in Table 3.6-4, below. The TRPA Code of Ordinances Section 20.5 discusses exceptions for coverage relocation requirements that allow for a 1:1 coverage relocation ratio for the Upper Truckee River and Marsh Restoration Project. This 1:1 ratio was used in evaluating potential project related impacts. Additional exceptions are related to bridges and boardwalks that may be accounted for at a lesser coverage ratio requirement. These were not used to evaluate impacts; therefore coverage impacts may be less than values presented in the discussion below.

Table 3.6-4
Proposed Changes in Coverage by LCD and Alternative

Element	LCD (Shorezone/Parcel)	Coverage (ft^2)[a]			
		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Public Access and Recreation Infrastructure Elements					
Observation area	6 (Parcel 4)	226	-	226	226
	1b (Other Parcels)	517	-	-	517
Fishing platform	1b (Parcel 4)	-	300	517	-
Viewpoints	1b (Parcel 4)	-	-	32	
	1b (Other Parcels)	264	-	160	160
Bicycle path	1b (Parcel 4)	4,448-5,560			
	6 (Parcel 4)	31,416-39,270	-	-	-
	1b (Other Parcels)	46,464-58,080	-	-	-
	7(Other Parcels)	24,848-31,060	-	15,536-19,420	16,930
Pedestrian trail	1b (Other Parcels)	1,350	536-804	8,692-13,038	5,616-8,424
	1b (Parcel 4)	-	2,229-3,342	2,212-3,318	1,316-1,974
	6 (Parcel 4)	1,320	14,252-21,378	18,376-27,564	17,148-25,722
	7 (Other Parcels)	1,578	1,076-1,614	4,432-6,648	1,360-2,040
Bridge	1b (Other Parcels)	1,800-2,250	-	-	-
Boardwalk	1b (Other Parcels)	26,232-32,790	2,000	5,128-6,410	4,840-6,050
	1b (Parcel 4)	4,032-5,040	-	-	-
	6 (Parcel 4)	24-30			
	1b (Parcel 5)	1,160-1,450	-	-	-
	7 (Other Parcels)	-	-	1,288-1,610	3,352-4,190
Kiosk	1b (Parcel 4)	60	-	60	60
	1b (Other Parcels)	60	-	-	-
Parking area	6 (Parcel 3)	20,720	-	-	-
Restoration and Enhancement Elements[b]					
User-created trail removal and restoration	1b (Parcel 4)	-3,416	-3,416	-3,416	-3,416
	6 (Parcel 4)	-34,484	-34,484	-34,484	-34,484
	1b (Parcel 5)	-16,724	-16,724	-16,724	-16,724
	1b (Other Parcels)	-60,745	-60,745	-60,745	60,745
	7 (Other Parcels)	-13,006	-13,006	-13,006	-13,006
TKPOA Corporation Yard restoration[e]	1b (Parcel 5)	-85,566	-85,566	-85,566	-

Notes:

[a] Range of square footage is given for elements with a range of potential widths in Table 2-3 and 2-4.

[b] Restoration and enhancement calculations based on subtracting existing coverage verification components.

Sources: Conservancy and DGS 2007b and SSURGO 2008

For a detailed description of the elements of each alternative, see Chapter 2, "Project Alternatives," which provides the dimensions of the elements in Tables 2-3 and 2-4. It is noted that additional coverage verifications were completed in 1992 and 1996 for this analysis the 2008 verification superseded the previous verifications and is used in determining potential impacts.

The earth resources–related environmental consequences of implementing the proposed alternatives were determined from a comparison with existing conditions, which are also embodied in Alternative 5, the No Project/ No Action Alternative. Mitigation is identified for all potential impacts. The proposed mitigation meets CEQA, NEPA, and TRPA requirements by reducing earth resources–related impacts to a less-than-significant level when feasible.

Hydrologic implications of seiches and tsunamis are discussed in Section 3.8, "Hydrology and Flooding."

EFFECTS NOT DISCUSSED FURTHER IN THIS EIR/EIS/EIS

Risks to People or Structures Caused by Surface Fault Rupture (CEQA 1) – The study area is located approximately 20 miles from the nearest Alquist-Priolo Earthquake Fault Zone, and the project site is not underlain by or adjacent to any known faults. Because the damage from surface fault rupture is generally limited to a linear zone a few yards wide, the potential for surface fault rupture to cause damage to proposed structures is negligible.

Landslide (CEQA 1) – A landslide or mudslide is the downhill movement of earth material under the force of gravity. The factors contributing to landslide potential are steep slopes, unstable terrain, and proximity to earthquake faults. The project site is relatively level and does not contain any steep slopes; therefore, it is not subject to landsliding and there would be no impact.

Expansive Soils (CEQA 4) – Based on a review of NRCS soil survey data discussed above, the entire study area is underlain by soils with low shrink-swell potential, indicating the soils are not expansive as defined in Table 18-1-B of the Uniform Building Code. Because construction would occur on soils with low shrink-swell potential, there would be no risk to life or property related to construction on expansive soils.

Septic systems (CEQA 5) – The project alternatives do not include and would not use septic tanks or alternative wastewater disposal systems. Therefore, there would be no impact.

Mineral resources (CEQA 6) – The MRZ designation provided by the CGS, coupled with the site-specific geologic and soils data indicate that there are no significant mineral deposits at the project site. Therefore, there would be no impact.

Damage or Destruction of Unique Paleontological Resources (CEQA 7) – The study area is underlain by Holocene-age artificial fill and basin deposits, which are not considered to be paleontologically sensitive rock formations. Therefore, there would be no impact related to damage or destruction of unique paleontological resources.

Avalanche Potential (TRPA 7) – An avalanche is a rapid flow of snow down a slope, from either natural triggers or human activity, typically occurring in mountainous terrain. For a slope to generate an avalanche it must be simultaneously capable of retaining snow and allowing snow to accelerate after it is set in motion. The study area is located in a flat marsh and is therefore not susceptible to avalanches. Therefore, implementing any of the project alternatives would have no effect on life and property related to avalanches.

Alternative 1: Channel Aggradation and Narrowing (Maximum Recreation Infrastructure)

IMPACT 3.6-1 (Alt. 1) **Soil Erosion, Sedimentation, and Loss of Topsoil. (CEQA 2, 3; TRPA 2, 3, 4)** *The topography, soils, vegetation, and drainage within the study area would be modified by restoration activities, public access, and recreation infrastructure planned under Alternative 1. Public access and recreation infrastructure would emphasize habitat protection by directing continued use and discouraging access to sensitive areas that are presently used by the public. Long-term conditions related to erosion, sedimentation, and loss of top soil would be improved with implementation of Alternative 1. Short-term exposure of soils to potential wind and water erosion would be protected through implementation of Environmental Commitments 5, 6, and 8. This impact would be* ***less than significant****.*

Existing user-created trails and other disturbed surfaces would be modified under Alternative 1. Defined paths, viewpoints, and signage, would emphasize habitat protection by directing continued use, and discouraging access to sensitive areas that have greater potential to be affected by disturbance. Implementing Alternative 1 would have a long-term beneficial effect by restoring some sensitive areas that are disturbed and/or compacted and limiting infiltration under the existing conditions.

Implementing Alternative 1 would require approximately four years of seasonal construction (between May 1 and October 15), with winter closedowns, except for BMP maintenance and monitoring. Construction would disturb areas in uplands, as well as in the active and 100-year floodplain and the main channels of the Upper Truckee River and Trout Creek. The extent of in-channel work would vary by year (see Alternative 1 construction schedule section in Section 2.6.2). Bridge installation, boat launch, lagoon construction, grade controls, bank protection measures, and transition connections would require work in the active channel. Floodplain reconstruction, paths, and most recreation components would be completed outside of the existing active channel. Nearly all of the disturbance areas, access routes, and staging areas would be within the 100-year floodplain (see Exhibit 3.8-14).

Implementing Alternative 1 would include implementing Environmental Commitment (EC) 5, "Prepare and Implement Effective Construction Site Management Plans to Minimize Risks of Water Quality Degradation and Impacts to Vegetation"; EC 6, "Obtain and Comply with Federal, State, Regional, and Local Permits"; and EC 8, "Prepare a Final Geotechnical Engineering Report, and Implement All Applicable Recommendations" (Table 2-6). Implementing these environmental commitments is expected to minimize vegetation removal and minimize the loss of topsoil and the need to import topsoil into the study area.

Implementing EC 5 would involve salvaging, reusing, and protecting on-site resources (e.g., willows) where possible. Efforts would be made to work as quickly as possible to move from initial disturbance through final revegetation throughout the study area. It is expected that disturbed areas would be exposed to winter conditions between summer construction seasons. Winterization protection could be needed throughout the construction zone, and possible overwinter use of staging, storage, or access areas may be necessary. All temporary stormwater controls and/or overwinter flood flow protections would be designed and sized to meet regulatory requirements but could be overwhelmed by a larger event if it occurred during the construction period. However, the probability of an event of greater magnitude occurring during either the summer low-flow seasons or the couple of intervening winters is low.

As described in EC 6, the Conservancy would obtain permits and approvals from several entities (e.g., El Dorado County, CSLT, TRPA, Lahontan Regional Water Quality Control Board, U.S. Army Corps of Engineers, and California Department of Fish and Game) that would impose conditions and requirements to minimize construction risks of water quality degradation by sediment or other pollutants. Although the general types of permit documents and their components are known, the specific measures, performance standards, and

enforcement elements would not be established until the time of acquisition. Several general construction management measures would be implemented to minimize environmental impacts, along with specific measures to control wind- and water-related erosion and to protect water quality (see Chapter 2, "Project Alternatives"). Exact erosion control measures (BMPs) or their performance standards are not specified at this time, but general BMPs would likely include use of construction fencing, silt fences, hay bales, temporary settling basins, vegetation protection, hydroseeding, and straw mulch. Construction activities that require access to the existing streambed or streambanks would require temporary dewatering of surface water in the river channel, and, where subsurface access is needed, temporary dewatering/pumping of groundwater that seeps into the work area may also be required. Conceptual approaches to dewatering have been identified for various elements of Alternative 1 in-channel work, but specific measures have not yet been determined (see Section 2.6.2, "Construction Activities and Schedule" for dewatering approaches.)

A geotechnical report would be prepared, and applicable recommendations from the report would be implemented as part of EC 8.

Based on the conceptual information regarding proposed construction management and ECs 5, 6, and 8 (Table 2-6), erosion, sedimentation, and loss of topsoil would be minimized. This impact would be **less than significant**.

IMPACT 3.6-2 (Alt. 1) **Risks to People and Structures Caused by Strong Seismic Ground Shaking. (CEQA 1, 3; TRPA 6, 7)**

Potentially active faults in the project vicinity could subject recreational users within the study area to damage from strong seismic ground shaking. However, project components would be designed in accordance with the CSLT and County codes as required by law. Alternative 1 would not expose additional people to geologic hazards. This impact would be ***less than significant****.*

Potentially active faults that are closest to the study area include the Genoa Fault and the Tahoe Valley Fault. The Genoa Fault is located approximately 20 miles east of the study area, and is capable of generating an earthquake of magnitude 7.4. The Tahoe Valley Fault Zone surrounds the study area to the north, west, and south. This Quaternary fault has a slip rate of <0.2 millimeter per year. Other fault zones in the Basin, including the North Tahoe and West Tahoe-Dollar Point, also may pose a hazard for strong seismic ground shaking in the project vicinity. The action alternatives would include construction of public access features, a parking lot, and a structure over the Upper Truckee River. The project does not include any buildings intended for human occupation. The project components would be designed and constructed in accordance with the CSLT's and County's seismic standards designed to reduce the risk of injury or property damage from seismic hazards, including strong ground shaking.

Alternative 1 would be constructed in soil types composed of loamy and gravelly sands, which have an extremely low shrink/swell potential. No previous landslides have been mapped in the project vicinity. The elevation in the study area is nearly level, and the public access and recreation infrastructure would be constructed to follow the existing natural contours to the extent feasible. Therefore, project construction would not result in the creation of unstable slopes that would subject recreational users to an increased hazard.

Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid, thus becoming similar to quicksand. Factors determining the liquefaction potential are soil type, the level and duration of seismic ground motions, the type and consistency of soils, and the depth to groundwater. Liquefaction poses a hazard to engineered structures. The loss of soil strength can result in bearing capacity insufficient to support foundation loads, increased lateral pressure on retaining walls, and slope instability. Based on a review of soil types associated with project facilities, it is possible that liquefaction could occur in the event of a large magnitude earthquake on one of the potentially active faults in the Lake Tahoe Basin. However, the project components would be designed and constructed in

accordance with CSLT and County design requirements (as required by law) that are intended to reduce the risk of injury or property damage from seismic hazards, including strong ground shaking.

Ichinose et al. (1999) show through simulations modeling wave propagation for various earthquake scenarios that if a large earthquake were to occur (approximately magnitude 7.0), a potential exists for both tsunami and seiche-related waves up to 30 feet to occur along the shore of Lake Tahoe. However, the project components would be constructed in an area that already has urban development and recreational facilities, including residential housing and a marina, and users of the public access facilities are expected to be people who already reside or recreate in the Tahoe Basin; therefore, construction of the proposed improvements would not create a situation that exposes additional people to tsunami hazards. Furthermore, there is no way of knowing whether or not a tsunami with enough force to damage project improvements or to present a safety hazard to recreational users would ever be generated during the lifetime of the project facilities. This impact would be **less than significant**.

IMPACT 3.6-3 (Alt. 1) **Changes in Land Coverage. (TRPA 5)** *Alternative 1 would involve removing and relocating land coverage in the study area. Existing coverage in the TKPOA Corporation Yard and a user-created trail network would be restored to permeable surfaces, and new public access infrastructure and parking would be created. Proposed land coverage in the study area on Parcels 3, 4, and 5 (defined by the Dillingham Settlement Agreement) under Alternative 1 would consist of approximately 63,406 – 73,676 square feet, which is significantly less than the total allowable coverage of 441,963 square feet. Proposed land coverage on all other parcels in the study area (regulated by the Bailey's System) would be 76,687–95,311 square feet in LCD 1b, and 26,426–32,638 square feet in LCD 7, which is well within the allowable coverage of 194,977 and 284,069 square feet for each LCD, respectively. Coverage relocation would be completed at a 1:1 ratio for the other parcels outside of the litigation parcels as allowed by the TRPA Code of Ordinances. Coverage relocation would be in compliance with Dillingham Settlement Agreement and as allowed by the TRPA Code of Ordinances. This impact would be* ***less than significant.***

The public access infrastructure and enhancement elements of Alternative 1 (the maximum recreation alternative) would involve removing and relocating land coverage in the study area (Table 3.6-5). This coverage would be concentrated around the perimeter of the study area, in LCDs 1b and 7. The restoration and enhancement elements of Alternative 1 would remove coverage associated with the TKPOA Corporation Yard. They also would remove coverage associated with a user-created network of trails currently found generally around the study area's perimeter and in much of the interior of the eastern half of the study area around Trout Creek (Exhibit 3.6-2). In general, coverage would be designed to reduce existing effects on sensitive resources, and/or would be situated in less-sensitive locations than the existing user-created trails that would be removed.

New coverage under Alternative 1 would include a parking area, bridge, boardwalk, and bike and pedestrian trails with observation areas and viewpoints. Coverage is typically regulated by Bailey's LCDs but because of the Dillingham Settlement Agreement (reference) coverage on portions of this study area is legally determined, while other portions are regulated by the typical methods.

In this case, Parcels 3, 4, and 5 (map reference) of the settlement agreement is allowed a total coverage amount of 441,963 regardless of parcel boundaries. The project would remove 140,190 square feet of verified coverage and add 63,406 – 73,676, depending on widths of trails. This is significantly less than the existing verified coverage and significantly less than the total allowed coverage of 441,963.

For all other parcels in the study area there are two LCD's, 1b and 7, in which coverage is proposed to be relocated. For LCD 1b, 60,745 square feet of verified coverage (volunteer trails restored) would be removed (Table 3.6-4) while 76,687–95,311 square feet (depending on trail widths) would be added. While this would increase the coverage by 15,942 – 34,566 square feet, it is significantly less than the allowed coverage of 194,977 square feet (Table 3.6-3). For LCD 7, 13,006 square feet of verified coverage (volunteer trails restored) would be removed (Table 3.6-4) while 26,426–32,638 square feet (depending on trail widths) would be added. While this

would increase the coverage by 13,420 – 19,632 square feet it is significantly less than the allowed coverage of 284,069 square feet (Table 3.6-3). Coverage relocation would be completed at a 1:1 ratio for the other parcels outside of the litigation parcels as allowed by the TRPA Code of Ordinances. Because the coverage proposed under Alternative 1 is consistent with the Dillingham Settlement Agreement and the TRPA Code of Ordinances and within the amount allowed in the study area, this impact would be **less than significant**.

Table 3.6-5
Proposed Land Coverage for Study Area

Parcel/Land Class	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Coverage Allowed On site (square feet)
Parcel 3—State Portion						
6	20,720				**0**	0[1]
Subtotal	**20,720**				**0**	**0[1]**
Parcel 4						
1b	8,540–10,660	2,529–3,642	2,821–3,927	1,376–2,034	3,416	
6	32,986–40,846	14,252–21,378	18,602–27,790	17,374–25,948	34,484	
Subtotal	**41,526–51,506**	**16,781–25,020**	**21,423–31,717**	**18,750–27,982**	**37,900**	**380,108[1]**
Parcel 5						
1b	1,160–1,450	0	0	85,566	102,290	
6	0	0	0	0	0	
Subtotal	**1,160–1,450**	**0**	**0**	**85,566**	**102,290**	**61,855[1]**
Other Parcels						
1b	76,687–95,311	2,536–2,804	13,980–19,608	11,133–15,151	60,745	194,977
7	26,426–32,638	1,076–1,614	21,256–27,678	21,642–23,160	13,006	284,069
Subtotal	**103,113–127,949**	**3,612–4,418**	**35,236–21,423**	**32,775–38,311**		**479,046**
Total	**166,519–201,625**	**20,393–29,438**	**56,659–79,003**	**137,091–151,859**	**166,810**	**1,029,194**

Notes:
[1] Allowable coverage is based on a litigation settlement agreement in *People of the State of California vs. Dillingham Development Company and TRPA*, CIV-S-85-0873-EJG (February 25, 1988). The coverage allowed on Parcels 3, 4, and 5 is a combined total that can be used on any of the parcels.
Source: Data provided by TRPA 2008, Conservancy and DGS 2007b, and SSURGO 2008

Alternative 2: New Channel – West Meadow (Minimum Recreation Infrastructure)

IMPACT 3.6-1 (Alt. 2) **Soil Erosion, Sedimentation, and Loss of Topsoil. (CEQA 2, 3; TRPA 2, 3, 4)** *The topography, soils, vegetation, and drainage within the study area would be modified under Alternative 2 by restoration activities and public access and recreation infrastructure features. Public access elements emphasize habitat protection that will limit erosion compared to existing conditions by directing and managing continued use, and discouraging access to sensitive areas that are presently used by the public. Long-term conditions related to erosion, sedimentation, and loss of top soil would be improved with implementation of Alternative 2. Short-term exposure of soils to potential wind and water erosion would be protected through implementation of Environmental Commitments 5, 6, and 8. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.6-1 (Alt. 1). Less construction associated with recreational infrastructure development would occur under Alternative 2 than Alternative 1. Based on the conceptual information regarding proposed construction management and ECs 5, 6, and 8 (as described in Table 2-6), erosion, sedimentation, and loss of topsoil would be minimized. For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.6-2 (Alt. 2) **Risks to People and Structures Caused by Strong Seismic Ground Shaking. (CEQA 1, 3; TRPA 6, 7)** *Potentially active faults in the project vicinity could subject recreational users within the study area to damage from strong seismic ground shaking. However, project components would be designed in accordance with the CSLT and County codes as required by law. Alternative 2 would not expose additional people to geologic hazards. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.6-2 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.6-3 (Alt. 2) **Changes in Land Coverage. (TRPA 5)** *Alternative 2 would involve removing and relocating land coverage in the study area. Existing coverage in the TKPOA Corporation Yard and a user-created trail network would be restored to permeable surfaces, and new public access infrastructure would be created. Proposed land coverage in the study area on Parcels 3, 4, and 5 (defined by the Dillingham Settlement Agreement) under Alternative 2 would consist of approximately 33,562 – 46,398 square feet, which is significantly less than the total allowable coverage of 441,963 square feet. Proposed land coverage on all other parcels in the study area (regulated by the Bailey's System) would be 2,536 – 2,804 square feet in LCD 1b, and 1,076 – 1,614 square feet in LCD 7, which is well within the allowable coverage of 194,977 and 284,069 square feet respectively. Coverage relocation would be completed at a 1:1 ratio for the other parcels outside of the litigation parcels as allowed by the TRPA Code of Ordinances. Coverage relocation would be in compliance with Dillingham Settlement Agreement and as allowed by the TRPA Code of Ordinances. Additionally, due to the overall reduction in coverage this impact would be* ***beneficial.***

The public access infrastructure and enhancement elements of Alternative 2 (the minimum recreation alternative) would involve removing and relocating land coverage in the study area (Table 3.6-5). This coverage would be concentrated around the perimeter of the study area, in LCDs 1b and 7. The restoration and enhancement elements of Alternative 2 would remove coverage associated with the TKPOA Corporation Yard. They also would remove coverage associated with a user-created network of trails currently found generally around the study area's perimeter and in much of the interior of the eastern half of the study area around Trout Creek (Exhibit 3.6-2). In general, coverage would be designed to reduce existing effects on sensitive resources, and/or would be situated in less-sensitive locations than the existing user-created trails that would be removed.

New coverage under Alternative 2 would include pedestrian trails, observation areas, a fishing platform, and a small boardwalk. Coverage is typically regulated by Bailey's LCDs but because of the Dillingham Settlement Agreement (1988), coverage on portions of this study area are legally determined, while other portions are regulated by the typical methods.

In this case as defined by the Settlement Agreement, parcels 3, 4, and 5 are allowed a total coverage amount of 441,963 regardless of parcel boundaries. The project would remove 140,190 square feet of verified coverage and add 33,562 – 46,398, depending on widths of trails. This is significantly less than the existing verified coverage and significantly less the total allowed coverage of 441,963.

For all other parcels in the study area there are two LCD's, 1b and 7, in which coverage is proposed to be relocated. For LCD 1b 60,745 square feet of verified coverage (volunteer trails restored and the TKPOA yard) would be removed (Table 3.6-4) while 2,536 – 2,804 square feet (depending on trail widths) would be added. This would reduce coverage by 58,209 – 57,941 square feet and is significantly less than the allowed coverage of

194,977 square feet (Table 3.6-3). For LCD 7, 13,006 square feet of verified coverage (volunteer trails restored and the TKPOA yard) would be removed (Table 3.6-4) while 1,076 – 1,614 square feet (depending on trail widths) would be added. This would reduce coverage by 11,930 – 11,392 square feet and is significantly less than the allowed coverage of 284,069 square feet (Table 3.6-3). Coverage relocation would be completed at a 1:1 ratio for the other parcels outside of the litigation parcels as allowed by the TRPA Code of Ordinances. Because the coverage proposed under Alternative 2 is consistent with the Dillingham Settlement Agreement and the Code of Ordinances and less than the existing amount, this impact would be **beneficial**.

Alternative 3: Middle Marsh Corridor (Moderate Recreation Infrastructure)

IMPACT 3.6-1 (Alt. 3) **Soil Erosion, Sedimentation, and Loss of Topsoil. (CEQA 2, 3; TRPA 2, 3, 4)** *The topography, soils, vegetation, and drainage within the study area would be modified by restoration, public access, and recreation infrastructure features added under Alternative 3. Public access elements will emphasize habitat protection that will limit erosion compared to existing conditions by directing and managing continued use, and discouraging access to sensitive areas that are presently used by the public. Long-term conditions related to erosion, sedimentation, and loss of top soil would be improved with implementation of Alternative 3. Short-term exposure of soils to potential wind and water erosion would be protected through implementation of Environmental Commitments 5, 6, and 8. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.6-1 (Alt. 1). Less construction associated with recreational infrastructure development would occur under Alternative 3 than Alternative 1.Based on the conceptual information regarding proposed construction management and ECs 5, 6, and 8 (as described in Table 2-6), erosion, sedimentation, and loss of topsoil would be minimized. For the same reasons described above, this impact would be **less than significant**.

IMPACT 3.6-2 (Alt. 3) **Risks to People and Structures Caused by Strong Seismic Ground Shaking (CEQA 1, 3; TRPA 6, 7).** *Potentially active faults in the project vicinity could subject recreational users within the study area to damage from strong seismic ground shaking. However, project components will be designed in accordance with the CSLT and County codes as required by law. Alternative 1 would not expose additional people to geologic hazards. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.6-2 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.6-3 (Alt. 3) **Changes in Land Coverage. (TRPA 5)** *Alternative 3 would involve removing and relocating land coverage in the study area. Existing coverage in the TKPOA Corporation Yard and a user-created trail network would be restored to permeable surfaces, and new public access infrastructure would be created. Proposed land coverage in the study area on Parcels 3, 4, and 5 (defined by the Dillingham Settlement Agreement) under Alternative 3 would consist of approximately 42,846 – 63,434 square feet, which is significantly less than the total allowable coverage of 441,963 square feet. Proposed land coverage on all other parcels in the study area would be 13,980 – 19,608 square feet in LCD 1b, and 21,256 – 27,678 square feet in LCD 7, which is well within the allowable coverage of 194,977 and 284,069 square feet respectively. Coverage relocation would be completed at a 1:1 ratio for the other parcels outside of the litigation parcels as allowed by the TRPA Code of Ordinances. Coverage relocation would be in compliance with Dillingham Settlement Agreement and as allowed by the TRPA Code of Ordinances. Additionally, due to the overall reduction in coverage this impact would be* ***beneficial.***

The public access infrastructure and enhancement elements of Alternative 3 (the moderate recreation alternative) would involve removing and relocating coverage in the study area (Table 3.6-5). This coverage would be concentrated around the perimeter of the study area, in LCDs 1b and 7. The restoration and enhancement elements

of Alternative 3 would remove coverage associated with the TKPOA Corporation Yard. They also would remove coverage associated with a user-created network of trails currently found generally around the study area's perimeter and in much of the interior of the eastern half of the study area around Trout Creek (Exhibit 3.6-2). In general, coverage would be designed to reduce existing effects on sensitive resources, and/or would be situated in less-sensitive locations than the existing user-created trails that would be removed.

New coverage under Alternative 3 would include a boardwalk, bike and pedestrian trails with a fishing platform, and observation areas and viewpoints. Coverage is typically regulated by Bailey's Land Capability Districts but because of the Dillingham Settlement Agreement (1988) coverage on portions of this study area are legally determined, while other portions are regulated by the typical methods.

In this case, Parcels 3, 4, and 5 (map reference) of the Settlement Agreement is allowed a total coverage amount of 441,963 regardless of parcel boundaries. The project would remove 140,190 square feet of verified coverage and add 42,846 – 63,434 square feet, depending on widths of trails. This is significantly less than the existing verified coverage and significantly less than the total allowed coverage of 441,963.

For all other parcels in the study area there are two LCD's, 1b and 7, in which coverage is proposed to be relocated. For LCD 1b, 60,745 square feet of verified coverage (volunteer trails restored) would be removed (Table 3.6-4) while 13,980 – 19,608 square feet (depending on trail widths) would be added. This would reduce coverage by 46,765 – 41,137 square feet and is significantly less than the allowed coverage of 194,977 square feet (Table 3.6-3). For LCD 7, 13,006 square feet of verified coverage (volunteer trails restored) would be removed (Table 3.6-4) while 21,256 – 27,678 square feet (depending on trail widths) would be added. While this would increase coverage by 8,250 – 14,672 square feet it is significantly less than the allowed coverage of 284,069 square feet (Table 3.6-3). Coverage relocation would be completed at a 1:1 ratio for the other parcels outside of the litigation parcels as allowed by the TRPA Code of Ordinances. Because the coverage proposed under Alternative 2 is consistent with the Dillingham Settlement Agreement and the Code of Ordinances and less than the existing amount, this impact would be **beneficial**.

Alternative 4: Inset Floodplain (Moderate Recreation Infrastructure)

IMPACT 3.6-1 (Alt. 4) **Soil Erosion, Sedimentation, and Loss of Topsoil (CEQA 2, 3; TRPA 2, 3, 4).** *The topography, soils, vegetation, and drainage within the study area would be modified by restoration, public access, and recreation infrastructure features added under Alternative 4. Public access elements will emphasize habitat protection that will limit erosion compared to existing conditions; they are intended to direct and manage continued use, and discourage access to sensitive areas that are presently used by the public. Long-term conditions related to erosion, sedimentation, and loss of top soil would be improved with implementation of Alternative 4. Short-term exposure of soils to potential wind and water erosion will be protected through implementation of Environmental Commitments 5, 6, and 8. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.6-1 (Alt. 1). Less construction associated with recreational infrastructure development would occur under Alternative 4 than Alternative 1. Based on the conceptual information regarding proposed construction management and ECs 5, 6, and 8 (as described in Table 2-6), erosion, sedimentation, and loss of topsoil would be minimized. For the same reasons described above this impact would be **less than significant**.

IMPACT 3.6-2 (Alt. 4) **Risks to People and Structures Caused by Strong Seismic Ground Shaking. (CEQA 1, 3; TRPA 6, 7)** *Potentially active faults in the project vicinity could subject recreational users within the study area to damage from strong seismic ground shaking. However, project components would be designed in accordance with the CSLT and County codes as required by law. Alternative 1 would not expose additional people to geologic hazards. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.6-2 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.6-3 (Alt. 4) **Changes in Land Coverage. (TRPA 5**) *Alternative 4 would involve removing and relocating land coverage in the study area. Existing coverage from a user-created trail network would be restored to permeable surfaces, and new public access and recreation infrastructure would be created. Proposed land coverage in the study area on Parcels 3, 4, and 5 (defined by the Dillingham Settlement Agreement) under Alternative 4 would consist of approximately 37,500 – 76,622 square feet, which is significantly less than the total allowable coverage of 441,963 square feet. Proposed land coverage on all other parcels in the study area would be 11,133 – 15,151 square feet in LCD 1b, and 21,642 – 23,160 square feet in LCD 7, which is well within the allowable coverage of 194,977 and 284,069 square feet respectively. Coverage relocation would be completed at a 1:1 ratio for the other parcels outside of the litigation parcels as allowed by the TRPA Code of Ordinances. Coverage relocation would be in compliance with Dillingham settlement agreement and as allowed by the TRPA Code of Ordinances. Additionally, due to the overall reduction in coverage this impact would be* ***beneficial****.*

The public access infrastructure and enhancement elements of Alternative 4 (the moderate recreation alternative) would involve removing and relocating land coverage in the study area (Table 3.6-5). This coverage would be concentrated around the perimeter of the study area, in LCDs 1band 7. The restoration and enhancement elements of Alternative 4 would remove coverage associated with a user-created network of trails currently found generally around the study area's perimeter and in much of the interior of the eastern half of the study area around Trout Creek (Exhibit 3.6-2). In general, created coverage would be designed to reduce existing effects on sensitive resources, and/or would be situated in less-sensitive locations than the existing user-created trails that would be removed.

The proposed coverage would include trails, viewpoints, and boardwalks. Coverage is typically regulated by Bailey's Land Capability Districts but because of the Dillingham Settlement Agreement (1988) coverage on portions of this study area are legally determined, while other portions are regulated by the typical methods.

In this case, Parcels 3, 4, and 5 (map reference) of the Settlement Agreement is allowed a total coverage amount of 441,963 regardless of parcel boundaries. The project would remove 54,624 square feet of verified coverage and add 37,500 – 76,622 square feet (depending on widths of trails). Although this could result in an increase in coverage it still would be significantly less than the total allowed coverage of 441,963.

For all other parcels in the study area there are two LCD's, 1b and 7, in which coverage is proposed to be relocated. For LCD 1b, 60,745 square feet of verified coverage (volunteer trails restored) would be removed (Table 3.6-4) while 11,133 – 15,151 square feet (depending on trail widths) would be added. This would reduce coverage by 49,612 – 45,594 square feet and is significantly less than the allowed coverage of 194,977 square feet (Table 3.6-3). For LCD 7, 13,006 square feet of verified coverage (volunteer trails restored) would be removed (Table 3.6-4) while 21,642 – 23,160 square feet (depending on trail widths) would be added. While this would increase coverage by 8,636 – 10,154 square feet it is significantly less than the allowed coverage of 284,069 square feet (Table 3.6-3). Unlike Alternatives 1–3, Alternative 4 would not remove coverage from the TKPOA Corporation Yard. Consequently, the overall reduction in coverage would be less. Coverage relocation would be completed at a 1:1 ratio for the other parcels outside of the litigation parcels as allowed by the TRPA Code of Ordinances. Because the coverage proposed under Alternative 2 is consistent with the Dillingham Settlement Agreement and the Code of Ordinances and less than the existing amount, this impact would be **beneficial**.

Alternative 5: No-Project/No-Action

IMPACT 3.6-1 (Alt. 5) **Soil Erosion, Sedimentation, and Loss of Topsoil. (CEQA 2, 3; TRPA 2, 3, 4)** *The topography, soils, vegetation, and drainage within the study area would not be modified under Alternative 5. Rates of soil erosion, sedimentation and loss of topsoil would remain comparable to existing conditions and no additional soil erosion, sedimentation, or loss of topsoil would occur as a result of construction activities. Thus, this impact would be* ***less than significant****.*

The topography, soils, vegetation, and drainage within the study area would not be modified under Alternative 5; therefore, soil erosion, sedimentation, and loss of topsoil within the study area would be similar to existing conditions. This impact would be **less than significant**.

IMPACT 3.6-2 (Alt. 5) **Risks to People and Structures Caused by Strong Seismic Ground Shaking. (CEQA 1, 3; TRPA 6, 7)** *Potentially active faults in the project vicinity could subject recreational users within the study area to damage from strong seismic ground shaking. Under Alternative 5, there would be no construction of restoration, recreation infrastructure, or public access features, so existing risks from strong seismic ground shaking would continue. No additional risks from project activities would occur. Thus,* **no impact** *would occur.*

No restoration, recreation infrastructure, or public access features would be constructed under Alternative 5; therefore, this alternative would not increase risks to people or structures related to seismic ground shaking. **No impact** would occur.

IMPACT 3.6-3 (Alt. 5) **Changes in Land Coverage. (TRPA 5)** *Under Alternative 5, no construction of restoration, recreation infrastructure, public access, or enhancement features would be completed. Existing coverage would continue to include 140,190 square feet on Parcels 3, 4, and 5 (Dillingham Settlement Agreement). All other parcels would continue to include 60,745 square feet in LCD 1b, and 13,006 square feet in LCD 6. This impact would be* ***less than significant****.*

No facilities or restoration activities would be constructed under Alternative 5; therefore, there would be no changes to land coverage within the study area. Existing coverage would continue to include 140,190 square feet in Dillingham Settlement Agreement Parcels 3, 4, and 5. All other parcels would continue to include 60,745 square feet in LCD 1b, and 13,006 square feet in LCD 6. This impact would be **less than significant.**

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3.7 HUMAN HEALTH / RISK OF UPSET

This section evaluates the potential risks to human health from hazardous materials, fire hazards, hazards to aviation, and public health impacts associated with implementation of the project. This section describes the regulatory background and existing environmental conditions in the study area and identifies potential impacts of the proposed alternatives and mitigation measures that would reduce those impacts to less-than-significant levels. Cumulative impacts are presented in Section 3.18, "Cumulative Impacts."

3.7.1 AFFECTED ENVIRONMENT

REGULATORY SETTING

Federal

Federal laws and regulations for the following topics related to human health and risk of upset are relevant to the proposed alternatives and described in detail in Chapter 5, "Compliance, Consultation, and Coordination":

- Hazardous Materials Management
- Transport of Hazardous Materials
- Worker Safety
- Airspace Safety
  - Obstructions and Airport Land Use Compatibility
  - Wildlife Hazards.

State

State laws and regulations for the following topics related to human health and risk of upset are relevant to the proposed alternatives and described in detail in Chapter 5, "Compliance, Consultation, and Coordination":

- Hazardous Materials Management
- Transport of Hazardous Materials and Emergency Response Plan
- Worker Safety
- Airspace Safety
- Wildfire Hazard Management.

Tahoe Regional Planning Agency

Goals and Policies

The 1987 Regional Plan does not include any goals or policies related to hazardous materials, worker safety, airspace safety, or vector control (TRPA 2006); however, it does include the following policy related to wildfire hazards under Goal 1 in the "Natural Hazards" section of Chapter 2 (Land Use Element):

- **Policy 3:** Inform residents and visitors of the wildfire hazard associated with occupancy in the Basin. Encourage use of fire resistant materials and fire preventative techniques when constructing structures, especially in the highest fire hazard areas. Manage forest fuels to be consistent with state laws and other goals and policies of this plan.

Code of Ordinances

Section 61.3.6.D of the TRPA Code of Ordinances (adopted November 15, 2011, effective March 1, 2012) (TRPA 2011) provides the following guidance related to hazards and hazardous materials that is applicable to the project:

> **Vegetation Management to Prevent the Spread of Wildfire:** Within areas of significant fire hazard, as determined by local, state or federal fire agencies, flammable or other combustible vegetation shall be removed, thinned, or manipulated in accordance with local and state law. Revegetation with approved species or other means of erosion control may be required where vegetative ground cover has been eliminated or where erosion problems may occur.

City of South Lake Tahoe

The *Lake Tahoe Airport Comprehensive Land Use Plan* (CLUP) establishes planning boundaries for the Lake Tahoe Airport and defines compatible types and patterns of future land uses that might occur in the area surround the airport (CSLT 2007). The purpose of the CLUP is to provide the Lake Tahoe Airport area with compatibility guidelines for height, noise, and safety.

The CLUP designates airport safety zones to the land surrounding the airport to minimize the number of people exposed to aircraft crash hazards. This is accomplished by enforcing land use restrictions in the safety zones. The CLUP designates three safety zones:

- the clear zone, which is near the runway and is the most restrictive;
- the approach/departure zone, which is located under the takeoff and landing slopes for each runway, extends outward for 5,000 feet from Runway 36 (with a width of 500–1,500 feet) and 10,000 feet from Runway 18 (with a width of 1,010–3,500 feet), and is less restrictive than the clear zone; and
- the overflight zone, which is the area overflown by aircraft during the normal traffic pattern, extends in all directions 5,000 feet from the center of each end of each runway, and is the least restrictive.

The southeastern portion of the study area between the Highland Woods subdivision and Trout Creek is within the approach/departure zone.

El Dorado County

El Dorado County Vector Control District

In 1915, the California Legislature adopted the Mosquito Abatement Act (now incorporated into the California Health and Safety Code as Chapter 5 of Division 3), which formed the basis for the creation, function, and governing powers of mosquito abatement districts. Mosquito abatement/vector control districts are local governmental organizations responsible for controlling specific disease vectors within their jurisdictions. They are authorized to conduct surveillance for vectors, prevent the occurrence of vectors, and abate production of vectors, on both private and public properties. Vector control districts also review, comment, and make recommendations regarding federal, state, or local land-use planning and environmental quality processes, documents, permits, licenses, and entitlements for projects and their potential effects with respect to vector production.

These districts receive most of their revenue from property taxes and are primarily responsible for controlling mosquitoes as pest species and as disease vectors. California law requires that if a problem source of mosquito production exists as a result of human-made conditions, the party responsible for those conditions is liable for the cost of abatement.

The El Dorado County Vector Control District (EDCVCD) was formed in 1963. EDCVCD is a division of the Environmental Management Department of El Dorado County. EDCVCD's service area encompasses 195 square miles, including the study area. The mission of EDCVCD is to provide vector control services and protect the public health and safety with minimal impact on the environment (EDCDEM 2012a).

El Dorado County Hazardous Materials Division

Chapter 8.40 of Title 8 of the El Dorado County Ordinance Code, Section 4332, requires any property owner with an underground storage tank (UST) that contains hazardous materials to obtain a permit from EDCDEM. Attachments A–D to Ordinance 4332 present requirements for construction activities surrounding USTs, as well as sampling approach/analysis and closure requirements. General requirements for construction activities surrounding a UST include erosion control, site safety, licensing requirements, and winter restrictions within the Lake Tahoe Basin.

ENVIRONMENTAL SETTING

Hazardous Materials

Definitions

For purposes of this section, the term "hazardous materials" refers to both hazardous substances and hazardous wastes. A hazardous material is defined by Federal regulations as "a substance or material that…is capable of posing an unreasonable risk to health, safety, and property when transported in commerce" (49 CFR 171.8). Section 25501 of the California Health and Safety Code defines a hazardous material as follows:

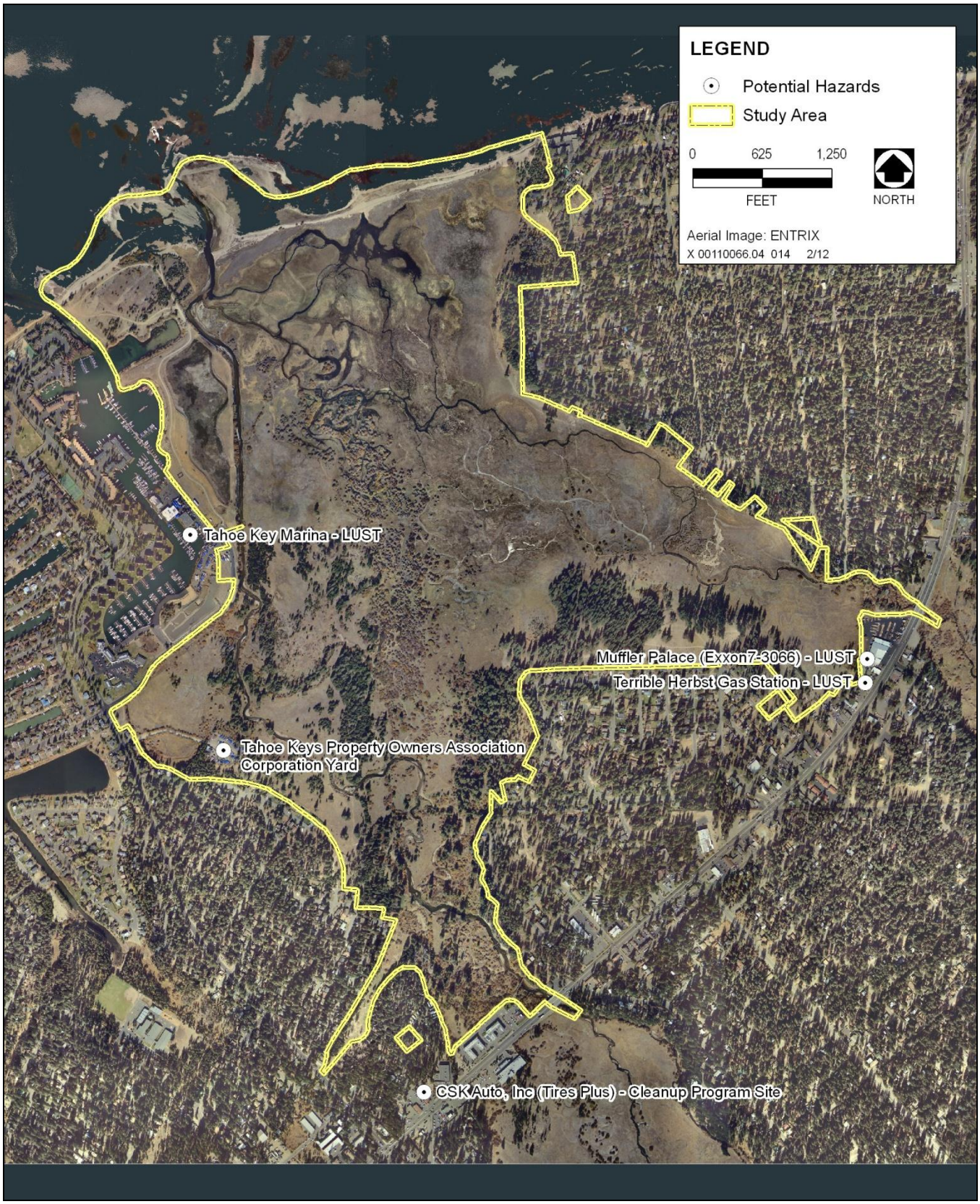
> Hazardous material means any material that, because of its quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Hazardous wastes are defined in Section 25141(b) of the California Health and Safety Code as wastes that:

> …because of their quantity, concentration, or physical, chemical, or infectious characteristics, [may either] cause, or significantly contribute to an increase in mortality or an increase in serious illness[, or] pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Potential Sources of Hazardous Materials in the Vicinity of the Study Area

The study area has been altered from its original condition as a result of human activities (logging; livestock grazing; road construction; and residential, commercial, and industrial developments). Thus, human-generated, hazardous wastes could exist within the study area. A search was performed by AECOM in 2008, and was updated in 2012, of the Geotracker database (the State Water Resources Control Board [SWRCB] information management system related to groundwater). Data relating to leaking underground storage tanks, and associated cleanup activities, are part of the information that SWRCB is required to maintain under California Public Resources Code (PRC) Section 65962.5 (i.e., the "Cortese List"). This search resulted in identification of three leaking underground storage tanks and one other site designated as an "Other Water Board Cleanup Site" close to, but not within the study area (SWRCB 2012). Exhibit 3.7-1 illustrates, and Table 3.7-1 lists, sites known by the SWRCB to be close to the study area.



Source: SWRCB 2012

Exhibit 3.7-1 **Known Hazardous Materials Sites within and near the Study Area**

Table 3.7-1
State Water Resources Control Board Potential Contamination Sites

Site	Designation	Potential Contaminant	Potential Media Affected	Cleanup Status
Tahoe Keys Marina	LUST	Gasoline	Surface water	Remediation
Muffler Palace	LUST	Perchloroethylene	Aquifer/drinking water	Site assessment
Terrible Herbst Gas Station	LUST	Gasoline, waste oil/motor/ hydraulic/lubricant	Aquifer/drinking water	Verification monitoring
Berry/Hinckley Industries Bulk Fuel Plant	Cleanup program site	Diesel, gasoline	Aquifer/drinking water	Verification monitoring

Note: LUST = leaking underground storage tank
Source: SWRCB 2012

The *Hazardous Waste and Substances Site List* (i.e., the "EnviroStor" database) is maintained by the California Department of Toxic Substances Control (DTSC) as part of the requirements of PRC Section 65962.5. A search of this list by AECOM in 2012 indicated that DTSC has no records of hazardous waste sites for South Lake Tahoe (DTSC 2012).

There is one Superfund site within the South Lake Tahoe area: the Meyers Landfill, located on Forest Road No. 1204 (i.e., "Garbage Dump Road") south of Pioneer Trail, approximately 2.5 miles south of the study area. The Meyers Landfill was operated by El Dorado County under a Forest Service Special Use Permit from approximately 1955 to 1971. Groundwater beneath the landfill has been contaminated by water leaching through the decomposing landfill waste. This has resulted in a groundwater contaminant plume that currently extends approximately 1,600 feet downgradient (i.e., northeast) from the landfill. The primary contaminants of concern are vinyl chloride (a carcinogen) and related volatile organic compounds (VOCs). The landfill itself has been covered with a cap of clean soil and a geomembrane layer, along with drainage improvements, to prevent further water infiltration through the landfill and into the groundwater. A series of groundwater monitoring wells have been installed and groundwater studies are ongoing. (EPA 2009; USFS 2009, 2010).

EPA maintains records of small- and large-quantity generators of hazardous waste pursuant to the Resource Conservation and Recovery Act through a national program management and inventory system about hazardous waste handlers. Small-quantity generators produce between 220 and 2,200 pounds of hazardous waste per month; large-quantity generators produce more than 2,200 pounds of hazardous waste or more than 2.2 pounds of acutely hazardous waste per month. This information is available to the public through EPA's EnviroMapper database (EPA 2012). Although no large-quantity generators are located near the study area, a number of small-quantity generators are located in the immediate vicinity of the study area, the closest of which are listed below:

- Pacific Bell (now AT&T), 2633 Sussex Avenue
- Rite Aid Drugstore No. 6107, 1020 Al Tahoe Boulevard

Potential Sources of Hazardous Materials in the Study Area

The only portion of the study area in which hazardous materials are currently used and stored is the TKPOA Corporation Yard. The TKPOA Corporation Yard is approximately 3.3 acres and is used primarily to store maintenance equipment, including several outboard motor boats, pickup trucks, and occasionally a backhoe. Hazardous materials are stored in on-site storage containers or within one of two storage sheds. The corporation yard is also used as a transfer point for milfoil weeds harvested from the Tahoe Keys Marina and its waterways. Hazardous materials stored on-site are limited to common hazardous substances, including fuel, lubricants such as oil, and solvents such as paint (Kleinfelder 2009).

The TKPOA Corporation Yard formerly operated fueling activities at the site and properly abandoned a 2,000-gallon UST in place by filling it with concrete (EDCDEM 2010). Soil contaminated with petroleum, which was located near the maintenance shop, was excavated in 2002 and 2003. The results of a Phase II Environmental Site Assessment performed in October 2009 indicated that previous excavation activities had not removed all the contaminated soil, and one of the groundwater samples for Total Petroleum Hydrocarbons in the gasoline range exceeded the allowable maximum contaminant level (Kleinfelder 2009). Therefore, upon completion of the Phase II Environmental Site Assessment, 91.62 tons of soil contaminated with petroleum was excavated from the maintenance shop and UST locations. Two monitoring wells were installed in 2010 and groundwater sampling results over two quarters indicated that groundwater was not affected in the areas where soil was excavated. A public notice stating the site did not pose a threat to human health or the environment was released by El Dorado County on October 22, 2010 (EDCDEM 2010).

Schools within One-Quarter Mile of the Study Area

Appendix G of the State CEQA Guidelines recommends that an EIR consider whether a project might emit or handle hazardous materials within one-quarter mile of an existing or proposed school. Four schools exist within one-quarter mile of the study area:

- Jubilee Preschool, approximately 0.24 mile from the study area
- Saint Theresa Catholic School (kindergarten through 8th grade), approximately 0.2 mile from the study area
- South Tahoe Middle School, approximately 0.2 mile from the study area
- Blue Ridge School, approximately 0.18 mile from the study area

Wildlife Hazards to Aviation

The Lake Tahoe Airport is located approximately 1 mile southwest of the nearest edge of the study area. The airport is equipped to be a commercial air carrier/general-aviation airport owned and operated by the CSLT, although it does not currently support commercial flights and there is no commercial operator at the airport. The airport includes one north-south asphalt runaway, which is 8,544 feet long by 150 feet wide (CSLT 2007).

The Lake Tahoe Airport is adjacent to the Upper Truckee River and its corridor of aquatic, wetland, riparian, and upland habitats that extends from upstream of the airport through South Lake Tahoe to the lake. The airport's location in this corridor, its proximity to Lake Tahoe, and the extensive areas of natural vegetation nearby create the potential for hazardous wildlife movement through the airport's clear, approach/departure, and overflight zones.

The study area provides habitat for several groups of species that can be hazardous to aviation (FAA 2007):

- *Waterfowl.* This group includes all ducks, geese, and swans. Although not strictly waterfowl, rails and grebes are also included in this guild. Most of the study area, including the river corridor, Sailing Lagoon and other open water, and wet and montane meadows, provides habitat for waterfowl.

- *Gulls.* The beach and dune, Sailing Lagoon and other open water, disturbed areas, and to a lesser extent, most other land cover types provide habitat for gulls.

- *Sparrows, Larks, and Finches.* Species in this group forage throughout most of the study area, and also breed in most land cover types.

- *Raptors.* Several species of raptors use the study area. The open cover types (e.g., montane and wet meadows) provide foraging habitat, and the lodgepole pine and Jeffrey pine forests provide perch sites and some nesting habitat for raptors.

- *Swallows*. Swallows are summer migrants, present from spring to early fall. The river and creek corridors, Sailing Lagoon and other open water, beach and dune, wetlands, and the wet and montane meadows all provide foraging habitat for swallows. Postbreeding flocks of swallows can be present in late summer, particularly when flying insects are abundant.

- *Blackbirds and starlings*. The disturbed areas, and to a lesser extent the beach, dune, and meadows in the study area provide foraging habitat for blackbirds and starlings. All species in this guild are gregarious and can form large flocks.

- *Corvids.* This guild includes ravens, magpies, and jays. Most of the study area provides habitat for these species.

- *Columbids*. Only two species in this guild occur at the study area: rock pigeon and mourning dove. In the study area, disturbed areas, the beach and dune, and to a lesser extent the montane meadows, provide habitats for columbids.

- *Wading birds*. This guild includes herons and egrets. The Upper Truckee River and Trout Creek, the margins of the Sailing Lagoon and of other open water, and wetlands in the study area provide habitat for wading birds.

Section 3.4, "Biological Resources: Vegetation and Wildlife," provides additional information on the use by hazardous wildlife of land cover within the study area. Habitat for these species groups is provided not only in the study area, but also outside of the study area in a large portion of the clear, approach/departure, and overflight zones, and in most of the 10,000-foot-wide Critical Zone (within which the Federal Aviation Administration (FAA) recommends minimizing attractants of hazardous wildlife).

Despite the presence of extensive habitat for hazardous wildlife in its vicinity, bird-plane collisions (i.e., bird strikes) have not been a problem at the Lake Tahoe Airport. There are no records of bird strikes at the Lake Tahoe Airport in the FAA Wildlife Strike Database (FAA 2012) or within the memory of airport staff (Camp Dresser and McKee [CDM] 2007).

Wildland Fire Hazards

Fire Hazards

Jeffrey pine and lodgepole pine forests cover portions of the study area adjacent to the Tahoe Island, Highland Woods, and Al Tahoe subdivisions (see Exhibit 3.4-1). Conditions within these forests affect the level of fire hazards in these adjacent neighborhoods.

Fires spread as a series of ignitions that occur when heat is transferred from burning fuel to adjacent fuels and raise the temperature of that adjacent fuel, causing it to ignite. Heat is transferred by contact with flames, radiated heat, and flying embers. These transfers of heat (and thus fire hazards) are affected by the arrangement (and moisture content) of woody debris and plants.

The Conservancy implements treatments to reduce the fire hazards posed by forest vegetation in the study area. Treatments include removing shrubs and trees to increase the spacing between tree crowns and the distance between understory vegetation (i.e., herbaceous plants, shrubs, and smaller tree saplings) and the tree canopy, and to reduce the total amount of vegetation and dead wood (USFS et al. 2007). Such treatments would reduce the severity and rate of spread of a fire.

Fuel Management

Forest vegetation on Conservancy property that poses fuel hazards is removed by the Conservancy. Since the Conservancy acquired majority ownership of the study area in 2000, fuel reduction efforts have focused primarily on removal of vegetation reported by citizens as dead or dying. Citizen requests for removal of vegetation in the study area perceived to be a potential fuel hazard increased after the Angora fire (June 2007), prompting the Conservancy to include the study area on the agency's fuel hazard reduction list in Summer 2007. The Conservancy flags vegetation within the study area and on nearby Conservancy-owned parcels, such as those parcels scattered among the privately owned residential parcels in the Al Tahoe neighborhood. Once vegetation is marked, the Conservancy is responsible for removal of fuels and periodic maintenance.

Mosquito Hazards

Mosquito Ecology

The life cycle of the mosquito consists of four stages: egg, larva, pupa, and adult (California Department of Public Health [CDPH] 2008:5–8). The egg, larva, and pupa stages are completed in calm, standing water in permanent, seasonal, or intermittent waters, including seasonal and permanent wetlands, and even in small isolated waters such as drying pools of ephemeral drainages, tire ruts, and artificial containers. Larvae hatch from eggs in water and feed on organic matter and microorganisms, such as bacteria. Fish and predatory insects feed on mosquito larva, and greatly reduce their abundance in permanent bodies of water. The pupa stage lasts several days, during which the larva changes into an adult. Seasonal and environmental conditions determine the length of time it takes for larval mosquitoes to complete their development; some species develop faster than others under the same conditions. Depending on average temperatures, it may take from four days to a month for the mosquito to mature from egg to adult; with warmer temperatures, development accelerates.

Adults may remain close to where they hatched or may disperse from several hundred yards to several miles, depending on the species (Walton 2003:2, CDPH 2008:Appendix D). Female mosquitoes require meals of blood for protein, so that they can produce eggs (CDPH 2008:5). Hosts that can supply blood include reptiles, amphibians, mammals (including humans), and birds. Most adult females live for about two weeks, though some may survive longer, and those that emerge late in the season may hibernate through the winter to begin laying eggs in the spring.

Common mosquitoes in the Tahoe Basin include species in the genus *Aedes* that breed in the standing water that results from melting snow; species in the genus *Culiseta* that breed in ponds, basins, and human-made containers; and *Culex tarsalis*, the "encephalitis mosquito" that can transmit to humans viruses that can cause encephalitis (an inflammation of the brain) (EDCDEM 2012b). The immature stages of *C. tarsalis* can develop in almost any standing freshwater (CDPH 2008).

All mosquito species are potential vectors of organisms that can cause disease to pets, domestic animals, wildlife, or humans (El Dorado County 2008). Public concern regarding West Nile virus, a disease transmitted to humans by mosquitoes (including *C. tarsalis*), has increased since the virus was first detected in the United States in 1999. A mosquito first acquires West Nile virus by feeding on a bird with the virus in its blood. Most people and animals that are infected with the virus have mild symptoms or none. In rare cases, the virus can cause encephalitis. West Nile Virus has been detected in the vicinity of the study area.

Mosquito Control

The study area is within EDCVCD's monitoring zone, and most of the study area is recognized as a breeding ground for mosquitoes. EDCVCD technicians identify and monitor mosquito breeding sources at least every 2 weeks from March through September. In years of especially heavy precipitation, some portions of the study area are especially prone to being inundated with standing water for long periods of time. Larvacides have been applied to standing water bodies within the study area. Treatments contain either methoprene, which mimics an

insect growth hormone to prevent adult mosquito development, or the bacterium *Bacillus thuringiensis israelensis*, which produces toxins that target mosquito larvae and other insects. The type and quantity of larvacide used is regulated by the California Department of Pesticide Regulation.

3.7.2 Environmental Consequences and Mitigation Measures

Significance Criteria

For this analysis, significance criteria are based on the checklist presented in Appendix G of the State CEQA Guidelines; the TRPA Initial Environmental Checklist; factual or scientific information and data; and regulatory standards of Federal, State, and local agencies. These criteria also encompass the factors taken into account under NEPA to determine the significance of an action in terms of the context and intensity of its effects.

CEQA Criteria

Under CEQA, an alternative was determined to result in a significant impact related to hazards or hazardous materials if it would:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (CEQA 1);
- create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment (CEQA 2);
- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school (CEQA 3);
- be located on a site that is included on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment (CEQA 4);
- be located within an airport land use plan, or within 2 miles of a public airport or public-use airport that would result in a safety hazard for people residing or working in the project area (CEQA 5);
- impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (CEQA 6); or
- expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands (CEQA 7).

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis.

TRPA Criteria

Based on TRPA's Initial Environmental Checklist, an alternative was determined to have a significant impact related to hazards and/or hazardous materials if it would:

- involve a risk of explosion or the release of hazardous substances (TRPA 1);

- create a health hazard or potential health hazard (TRPA 2); or
- expose people to potential health hazards (TRPA 3).

METHODS AND ASSUMPTIONS

This analysis considers the range and nature of foreseeable use, storage, and disposal of hazardous materials resulting from the project alternatives and the No-Project/No-Action Alternative, and identifies the primary ways that these hazardous materials could expose individuals or the environment to health and safety risks. As discussed above, compliance with applicable federal, state, and local health and safety laws and regulations by residents and businesses in the project vicinity would generally protect public health and safety. State and local agencies would be expected to continue to enforce applicable requirements to the extent that they do now.

The following reports documenting potential hazardous conditions in the study area were reviewed for this analysis:

- applicable land use plans;
- available literature, including documents published by federal, state, county, and city agencies; and
- applicable elements from the *El Dorado County General Plan.*

The information obtained from these sources was reviewed and summarized to establish existing conditions and to evaluate the significance of potential environmental impacts, based on the significance criteria presented above. In determining the level of significance, this analysis assumes that construction and operation of any alternative would comply with relevant federal, state, regional, and local ordinances and regulations.

EFFECTS NOT DISCUSSED FURTHER IN THIS EIR/EIS/EIS

Hazardous Materials Sites (CEQA 4)—There are no hazardous materials sites subject to compliance with Government Code Section 65962.5 in the study area.

Emergency Plans (CEQA 6)—No alternatives would impair implementation of or physically interfere with an adopted emergency response plan or evacuation plan.

IMPACT ANALYSIS AND MITIGATION MEASURES

Alternative 1: Channel Aggradation and Narrowing (Maximum Recreation Infrastructure)

IMPACT 3.7-1 (Alt. 1) **Potential Hazards to the Public from Use of Hazardous Materials. (CEQA 1, 2; TRPA 1, 2, 3)** *Alternative 1 would involve the storage, use, and transport of hazardous materials in the study area during construction activities. However, as described in Environmental Commitments 5 and 6, the Conservancy would develop construction site management plans and comply with Federal, State, and local regulations related to hazardous materials to avoid or minimize potential impacts on health and safety during project construction. Thus, significant hazards to the public would not be created during construction through routine transport, storage, use, disposal, and risk of upset. This impact would be* ***less than significant****.*

Alternative 1 would involve the storage, use, and transport of hazardous materials (e.g., fuels, oils, lubricants) during construction activities. However, to avoid or minimize potential impacts on health and safety during project construction, the Conservancy would implement Environmental Commitment (EC) 5, "Prepare and Implement Effective Construction Site Management Plans to Minimize Risks of Water Quality Degradation and Impacts to Vegetation," and EC 6, "Obtain and Comply with Federal, State, Regional, and Local Permits," described in Table 2-6 in Chapter 2. Transport of hazardous materials on area roadways is regulated by the California Highway Patrol and Caltrans, whereas use of these materials is regulated by DTSC, as outlined in Title

22 of the California Code of Regulations. The Conservancy, contractors, and others would be required to use, store, and transport hazardous materials in compliance with federal, state, and local regulations during project construction and operation. Activities that would use hazardous materials on-site after the project is constructed would be required to obtain permits and comply with appropriate regulatory agency standards and permit requirements designed to avoid releases of hazardous waste. No hazardous materials are expected to be needed after project completion. Because the project would implement and comply with existing hazardous-materials regulations (e.g., regulations administered by Cal OSHA, DTSC) and permit requirements, impacts related to creation of significant hazards to the public through routine transport, use, disposal, and risk of upset would not occur with project development. Therefore, this impact would be **less than significant**.

IMPACT 3.7-2 (Alt. 1) **Potential Hazards to Human Health from Exposure to Existing On-Site Hazardous Materials. (CEQA 2; TRPA 1, 2, 3)** *Alternative 1 could expose construction workers to hazardous materials present on-site during construction activities at the TKPOA Corporation Yard and hazardous materials on-site could create an environmental or health hazard if left in place. As described in Environmental Commitment 9, the Conservancy would develop and implement a construction management program; however, this impact would be* ***potentially significant****.*

The only portion of the study area in which hazardous materials are currently used and stored is the TKPOA Corporation Yard. Hazardous materials are stored in on-site storage containers or within one of two storage sheds. Hazardous materials stored on-site are confined to common hazardous substances, including fuel, lubricants such as oil, and solvents such as paint. In the past, although applicable regulations may have been followed, spills of hazardous materials may have occurred and contaminated soil at the TKPOA Corporation Yard. Furthermore, TKPOA Corporation Yard formerly operated fueling activities at the site and properly abandoned a 2,000-gallon UST in place by filling it with concrete. Soil contaminated with petroleum near the maintenance shop was excavated in 2002 and 2003. As part of a Phase II Environmental Site Assessment performed in 2009, 91.62 tons of soil contaminated with petroleum were excavated from the maintenance shop and UST locations. Two monitoring wells were installed in 2010 and groundwater sampling results over two quarters indicated that groundwater was not affected in the areas of soil excavation. A public notice stating the site did not pose a threat to human health or the environment was released by El Dorado County on October 22, 2010 (El Dorado County 2010).

Movement of stored hazardous materials and fill materials from the TKPOA Corporation Yard would occur during construction of restoration features; consequently, construction workers might be exposed to existing on-site hazardous materials at the corporation yard. To avoid or minimize potential impacts on health and safety during project construction, the Conservancy would implement EC 9, "Develop and Implement a Construction Management Program," described in Table 2-6 in Chapter 2; however, implementing EC 9 would not be sufficient to avoid all potential hazards to human health from exposure to on-site hazardous materials. Therefore, this impact would be **potentially significant**.

Mitigation Measure 3.7-2a (Alt. 1): Prepare and Implement a Health and Safety Plan and Provide Qualified Oversight of Fill Removal Related to Excavation Activities at the Corporation Yard.

- The Conservancy and their contractor(s) will develop and implement a health and safety plan (HASP) that clearly notifies all workers of the potential to encounter hazardous materials during demolition and construction activities. The HASP will identify proper handling and disposal procedures for contaminants expected to be on-site as well as maps and phone numbers for local hospitals and other emergency contacts. All protocols outlined in the HASP will be complied with throughout project implementation.

- Any stored hazardous materials present in the study area will be removed and disposed at appropriately permitted locations prior to construction. A qualified professional (e.g., geologist or engineer) will oversee fill excavation activities and abandoned UST tank removal at the Corporation Yard in order to properly identify any potentially contaminated soils. that may be present. Excavation of the UST must comply with El Dorado

County UST Ordinance No. 4332. If contaminated soils are found, implement Mitigation Measure 3.7-2b (Alt 1).

- UST tank removal will include measures that ensure the safe transport, and disposal methods. Remediation actions, if necessary, will be defined, in consultation with the EDCDEM, DTSC, and Lahontan Regional Water Quality Control Board (RWQCB), and implemented during construction.

Mitigation Measure 3.7-2b (Alt. 1): Notify Appropriate Federal, State, and Local Agencies if Contaminated Soils Are Identified, and Complete Recommended Remediation Activities.

To reduce health hazards associated with potential exposure to hazardous substances, the Conservancy would implement the following measures if necessary:

- The Conservancy and its contractor(s) will notify the appropriate federal, state, and local agencies if evidence of previously undiscovered soil or groundwater contamination (e.g., stained soil, odorous groundwater) is encountered during construction activities. Any contaminated areas will be cleaned up in accordance with recommendations made by the EDCDEM, the Lahontan RWQCB, DTSC, or other appropriate federal, state, or local regulatory agencies, as generally described above.

- The Conservancy will prepare a site plan for remediation activities appropriate for proposed land uses, including excavation and removal of on-site contaminated soils, and needed redistribution of clean fill material on the study area. The plan will include measures that ensure the safe transport, use, and disposal of contaminated soil and building debris removed from the site. If contaminated groundwater is encountered during site excavation activities, the construction contractor will report the contamination to the appropriate regulatory agencies, dewater the excavated area, and treat the contaminated groundwater to remove contaminants before discharge into the sanitary sewer system. The construction contractor will be required to comply with the plan and applicable federal, state, and local laws. The plan will outline measures for specific handling and reporting procedures for hazardous materials, and disposal of hazardous materials removed from the site at an appropriate off-site disposal facility.

Significance after Mitigation: Because the removal and remediation of any contaminated soil that may be encountered and the removal of the UST at the TKPOA Corporation Yard would be overseen by the appropriate entities, the potential for exposure to hazardous materials would be substantially reduced. Therefore, with implementation of Mitigation Measure 3.7-2a (Alt. 1) and 3.7-2 (Alt. 1) as described above, Impact 3.7-2 (Alt. 1) would be **less than significant**.

IMPACT 3.7-3 (Alt. 1)	**Potential Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School. (CEQA 3; TRPA 1, 2, 3)** *Under Alternative 1, some construction activities that involve the handling of hazardous or acutely hazardous materials could occur within one-quarter mile of a school. Also, hazardous materials present on-site may be exposed during construction activities within one-quarter mile of a school. However, as described in Environmental Commitment 9, the school district would be notified about proper handling of hazardous materials related to the project before the EIR/EIS/EIS is certified. This impact would be* ***less than significant****.*

Four schools are located within one-quarter mile of the study area, and under Alternative 1 some construction activities involving the handling of hazardous or acutely hazardous materials could occur within one-quarter mile of these schools. However, during construction activities, the use of hazardous materials would occur in compliance with federal, state, and local regulations. As described in Impact 3.7-1 (Alt. 1), impacts related to creation of hazards through routine transport, storage, use, disposal, and risk of upset would be less than significant. However, as described in Impact 3.7-2 (Alt. 1), hazardous materials could already be present on-site, and if present, may be exposed during construction activities. As described in EC 9 (Table 2-6), the Conservancy and its contractors shall provide written notification of the project to the Lake Tahoe Unified School District, as

required by PRC Section 21151.4, at least 30 days before certification of the EIR/EIS/EIS and shall consult with the school district regarding proper handling and disposal methods associated with substances subject to California Health and Safety Code Section 25532. Therefore, this impact would be **less than significant**.

IMPACT 3.7-4 (Alt. 1) **Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation. (TRPA 3)** *Alternative 1 would result in more extensive floodplain inundation that could result in greater abundance of mosquitoes; however, as described in Environmental Commitment 10, the Conservancy would continue to coordinate with and support EDCVCD efforts to manage mosquito populations, and thus, not increase the potential for exposure of people to mosquito-borne viruses. This impact would be* ***less than significant****.*

Much of the study area is recognized by EDCVCD as a breeding ground for mosquitoes, and thus, the district monitors the abundance of mosquito larva and implements treatments to control mosquitoes, as necessary. Although the study area already provides existing breeding habitat for mosquitoes, in some years Alternative 1 would increase the extent of floodplain inundation (e.g., the two-year streamflow event would inundate approximately an additional 12 acres [Conservancy 2006:A1]). This additional inundation would increase the extent and duration of calm, standing water in dense vegetation, and therefore, could enhance breeding habitat for mosquitoes. As a result, Alternative 1 could increase mosquito abundance. However, as described in EC 10, "Establish and Implement a Management Agreement with the El Dorado County Vector Control District," described in Table 2-6 in Chapter 2, the Conservancy would continue to coordinate with and support EDCVCD efforts to control mosquito populations in the study area. The Conservancy would coordinate management activities with EDCVCD and implement measures as necessary to ensure necessary access for monitoring and control. Therefore, the potential for exposure of people to mosquito-borne viruses would remain comparable to existing conditions in the study area. This impact would be **less than significant**.

IMPACT 3.7-5 (Alt. 1) **Potential for Airspace Safety Hazards Associated with Restoration and Enhancement of Habitat for Hazardous Wildlife. (CEQA 5)** *Alternative 1 would restore or enhance some habitat for hazardous wildlife in and near the approach/departure zone of the Lake Tahoe Airport. However, extensive habitat attracting hazardous wildlife already exists in the study area, and thus, Alternative 1 is not anticipated to substantially increase the attraction of hazardous wildlife. Also, the CLUP identifies management of timber, fish, and wildlife habitat, as well as SEZ restoration, as compatible land uses for the approach/departure zone. Furthermore, bird-aircraft collisions have not been occurring at the Lake Tahoe Airport, notwithstanding the presence of habitat for hazardous wildlife along the Upper Truckee River at the airport. Therefore, this impact would be* ***less than significant****.*

Existing habitats in the study area are an attractant to wildlife that could potentially pose a hazard to aircraft. Alternative 1 would enhance or restore some habitat for birds that are categorized as hazardous wildlife in terms of the potential for aircraft collisions. In particular, this alternative would increase the extent of floodplain inundation and would modify existing waterways to create lagoon habitat.

This restored habitat would be located at a distance of approximately one mile or more from the airport. The increased floodplain inundation and lagoon restoration would be outside of the approach/departure zone of the Lake Tahoe Airport, but within the 10,000-foot-wide zone where FAA recommends that wildlife attractants be minimized. Bird-attracting habitats are already present in these locations, and enhancement and restoration activities are not anticipated to cause a substantial increase in the attraction of hazardous wildlife.

SEZ restoration, timber management, range management, and management of fish and wildlife habitat are identified in the CLUP as compatible land uses for the clear, approach/departure, and overflight zones of the Lake Tahoe Airport (CSLT 2007:38). Thus, a wide range of management, enhancement, and restoration activities in nearby natural vegetation is considered compatible with the airport's operations.

Furthermore, bird strikes have not historically affected aviation safety at the Lake Tahoe Airport. There are no records of bird-related air strikes in the FAA Wildlife Strike Database (FAA 2012) or within the memory of airport staff (CDM 2007). With or without project implementation, the likelihood of wildlife-aircraft accidents associated with the Lake Tahoe Airport is considered low. Recognizing that bird-aircraft collisions have not been occurring at the Lake Tahoe Airport despite the presence of extensive, immediately surrounding forest, riparian, and meadow habitat, the enhancement of habitat a mile or more from the airport would not substantially change aircraft safety conditions. Because an increase in wildlife-related hazards under Alternative 1 is not expected and the proposed land uses in under Alternative 1 are compatible with the CLUP, this impact would be **less than significant**.

IMPACT 3.7-6 (Alt. 1) **Potential for Wildland Fire Caused by Construction Equipment.** *During the dry summer season, sparks from on-site construction equipment could result in wildland fire. However, as described in Environmental Commitment 9, the Conservancy would develop and implement a fire prevention and management plan to minimize the risk of accidental ignition of wildland fires. Therefore, this impact would be* ***less than significant****.*

During summer, the project site consists of dry annual and perennial grasses and low-growing shrubs. Therefore, the project components would be constructed in an area where the combination of physical and weather factors may lead to a high wildfire hazard. Operation of construction equipment could result in accidental ignition of wildland fires that may pose a significant risk of loss, injury, or death. However, as described in EC 9 (Table 2-6), the Conservancy would develop and implement a fire prevention and management plan to minimize the risk of accidental ignition of wildland fires. This impact would be **less than significant**.

Alternative 2: New Channel—West Meadow (Minimum Recreation Infrastructure)

IMPACT 3.7-1 (Alt. 2) **Potential Hazards to the Public from Use of Hazardous Materials. (CEQA 1, 2 TRPA 1, 2, 3)** *Alternative 2 would involve the storage, use, and transport of hazardous materials in the study area during construction activities. However, as described in Environmental Commitments 5 and 6, the Conservancy would develop construction site management plans and comply with federal, state, and local regulations related to hazardous materials to avoid or minimize potential impacts on health and safety during project construction. Therefore, significant hazards to the public would not be created during construction through routine transport, storage, use, disposal, and risk of upset. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.7-1 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.7-2 (Alt. 2) **Potential Hazards to Human Health from Exposure to Existing On-Site Hazardous Materials. (CEQA 1, 2; TRPA 1, 2, 3)** *Alternative 2 could expose construction workers to hazardous materials present on-site during construction activities at the TKPOA Corporation Yard and hazardous materials on-site could create an environmental or health hazard if left in place. As described in Environmental Commitment 9, the Conservancy would develop and implement a construction management program; however, this impact would be* ***potentially significant****.*

This impact is identical to Impact 3.7-2 (Alt. 1). For the same reasons as described above, this impact would be **potentially significant**.

Mitigation Measure 3.7-2a (Alt. 2): Prepare and Implement a Health and Safety Plan and Provide Qualified Oversight of Fill Removal Related to Excavation Activities at the Corporation Yard.

This mitigation measure is identical to Mitigation Measure 3.7-2a (Alt. 1).

Mitigation Measure 3.7-2b (Alt. 2): Notify Appropriate Federal, State, and Local Agencies if Contaminated Soils Are Identified, and Complete Recommended Remediation Activities.

This mitigation measure is identical to Mitigation Measure 3.7-2b (Alt. 1).

Significance after Mitigation: With implementation of Mitigation Measure 3.7-2a (Alt. 2) and 3.7-2b (Alt. 2), Impact 3.7-2 (Alt. 2) would be **less than significant**.

IMPACT 3.7-3 (Alt. 2) **Potential Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School. (CEQA3; TRPA 1, 2, 3)** *Under Alternative 2, some construction activities that involve the handling of hazardous or acutely hazardous materials could occur within one-quarter mile of a school. Also, hazardous materials present on-site may be exposed during construction activities within one-quarter mile of a school. However, as described in Environmental Commitment 9, the school district would be notified in regards to handling of hazardous materials related to the project before the EIR/EIS/EIS is certified. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.7-3 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.7-4 (Alt. 2) **Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation. (TRPA 3)** *Alternative 2 would result in more extensive floodplain inundation that could result in greater abundance of mosquitoes. However, as described in Environmental Commitment 10, the Conservancy would continue to coordinate with and support EDCVCD efforts to manage mosquito populations, and thus, not increase the potential for exposure of people to mosquito-borne viruses. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.7-4 (Alt. 1), but would increase floodplain inundation acreage more than Alternative 1. (For example, the two-year streamflow event under Alternative 2 would inundate an additional 63 acres, compared with an additional 12 acres under Alternative 1 [Conservancy 2006:A1].) Nonetheless, for the same reasons as described for Alternative 1, this impact would be **less than significant**.

IMPACT 3.7-5 (Alt. 2) **Potential for Airspace Safety Hazards Associated with Restoration and Enhancement of Habitat for Hazardous Wildlife. (CEQA 5)** *Alternative 2 would restore or enhance some habitat for hazardous wildlife in and near the approach/departure zone of the Lake Tahoe Airport. However, extensive habitat attracting hazardous wildlife already exists in the study area, and thus, Alternative 1 is not anticipated to substantially increase the attraction of hazardous wildlife. Also, the CLUP identifies management of timber, fish, and wildlife habitat, as well as SEZ restoration, as compatible land uses for the approach/departure zone. Furthermore, bird-aircraft collisions have not been occurring at the Lake Tahoe Airport, notwithstanding the presence of the Upper Truckee River riparian corridor habitat near the airport. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.7-5 (Alt. 1), but slightly greater than Alternative 1 because Alternative 2 would inundate a greater acreage during 2-year streamflow events. However, for the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.7-6 (Alt. 2) **Potential for Wildland Fire Caused by Construction Equipment.** *During the dry summer season, sparks from on-site construction equipment could result in wildland fire. However, as described in Environmental Commitment 9, the Conservancy would develop and implement a fire prevention and management plan to minimize the risk of accidental ignition of wildland fires. Therefore, this impact would be* ***less than significant****.*

This impact is identical to Impact 3.7-6 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

Alternative 3: Middle Marsh Corridor (Moderate Recreation Infrastructure)

IMPACT 3.7-1 (Alt. 3) **Potential Hazards to the Public from Use of Hazardous Materials. (CEQA 1, 2; TRPA 1, 2, 3)** *Alternative 3 would involve the storage, use, and transport of hazardous materials in the study area during construction activities. However, However, as described in Environmental Commitments 5 and 6, the Conservancy would develop construction site management plans and comply with federal, state, and local regulations related to hazardous materials to avoid or minimize potential impacts on health and safety during project construction. Therefore, significant hazards to the public would not be created during construction through routine transport, storage, use, disposal, and risk of upset. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.7-1 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.7-2 (Alt. 3) **Potential Hazards to Human Health from Exposure to Existing On-Site Hazardous Materials. (CEQA 2; TRPA 1, 2, 3)** *Alternative 3 could expose construction workers to hazardous materials present on-site during construction activities at the TKPOA Corporation Yard, and hazardous materials on-site could create an environmental or health hazard if left in place. As described in Environmental Commitment 9, the Conservancy would develop and implement a construction management program; however, this impact would be* ***potentially significant****.*

This impact is identical to Impact 3.7-2 (Alt. 1). For the same reasons as described above, this impact would be **potentially significant**.

Mitigation Measure 3.7-2a (Alt. 1): Prepare and Implement a Health and Safety Plan and Provide Qualified Oversight of Fill Removal Related to Excavation Activities at the Corporation Yard.

This mitigation measure is identical to Mitigation Measure 3.7-2a (Alt. 1).

Mitigation Measure 3.7-2b (Alt. 1): Notify Appropriate Federal, State, and Local Agencies if Contaminated Soils Are Identified, and Complete Recommended Remediation Activities.

This mitigation measure is identical to Mitigation Measure 3.7-2b (Alt. 1).

Significance after Mitigation: With implementation of Mitigation Measure 3.7-2a (Alt. 3) and 3.7-2b (Alt. 3), Impact 3.7-2 (Alt. 3) would be **less than significant**.

IMPACT 3.7-3 (Alt. 3) **Potential Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School. (CEQA 2; TRPA 1, 2, 3)** *Under Alternative 3, some construction activities that involve the handling of hazardous or acutely hazardous materials could occur within one-quarter mile of a school. Also, hazardous materials present on-site may be exposed during construction activities within one-quarter mile of a school. However, as described in Environmental Commitment 9, the school district would be notified regarding handling of hazardous materials related to the project before the EIR/EIS/EIS is certified. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.7-3 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.7-4 (Alt. 3) **Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation. (TRPA 3)** *Alternative 3 would result in more extensive floodplain inundation that could result in greater abundance of mosquitoes. However, as described in Environmental Commitment 10, the Conservancy would continue to coordinate with and support EDCVCD efforts to manage mosquito populations, and thus, not increase the potential for exposure of people to mosquito-borne viruses. This impact would be* ***less than significant****.*

This impact is similar to Impacts 3.7-4 (Alt. 1) and 3.7-4 (Alt. 2), but the extent of floodplain inundation would be greater than Alternatives 1 or 2. (For example, the 2-year streamflow event under Alternative 3 would inundate an additional 92 acres, compared with an additional 12 acres and 63 acres under Alternatives 1 and 2, respectively [Conservancy 2006:A1].) Nonetheless, for the same reasons as described for Alternative 1, this impact would be **less than significant**.

IMPACT 3.7-5 (Alt. 3) **Potential for Airspace Safety Hazards Associated with Restoration and Enhancement of Habitat for Hazardous Wildlife (CEQA 5).** *Alternative 3 would restore or enhance habitat for hazardous wildlife in and near the approach/departure zone of the Lake Tahoe Airport. However, extensive habitat attracting hazardous wildlife already exists in the study area, and thus, Alternative 3 is not anticipated to substantially increase the attraction of hazardous wildlife. Also, the CLUP identifies management of timber, fish, and wildlife habitat, as well as SEZ restoration, as compatible land uses for the approach/departure zone. Furthermore, bird-aircraft collisions have not been occurring at the Lake Tahoe Airport, notwithstanding the presence of the Upper Truckee River riparian corridor habitat near the airport. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.7-6 under Alternatives 1 and 2, although Alternative 3 would inundate a greater area during two-year streamflow events than would Alternatives 1 and 2 and would not create lagoon habitat. For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.7-6 (Alt. 3) **Potential for Wildland Fire Caused by Construction Equipment.** *During the dry summer season, sparks from on-site construction equipment could result in wildland fire. However, as described in Environmental Commitment 9, the Conservancy would develop and implement a fire prevention and management plan to minimize the risk of accidental ignition of wildland fires. Therefore, this impact would be* ***less than significant****.*

This impact is identical to Impact 3.7-6 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

Alternative 4: Inset Floodplain (Moderate Recreation Infrastructure)

IMPACT 3.7-1 (Alt. 4) **Potential Hazards to the Public from Use of Hazardous Materials (CEQA 1, 2; TRPA 1, 2, 3).** *Alternative 4 would involve the storage, use, and transport of hazardous materials in the study area during construction activities. However, as described in Environmental Commitments 5 and 6, the Conservancy would develop construction site management plans and comply with federal, state, and local regulations related to hazardous materials to avoid or minimize potential impacts on health and safety during project construction. Therefore, significant hazards to the public would not be created during construction through routine transport, storage, use, disposal, and risk of upset. This impact would be* ***less than significant****.*

This impact is identical to Impact 3.7-1 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.7-2 (Alt. 4) **Potential Hazards to Human Health from Exposure to Existing On-Site Hazardous Materials (CEQA 2; TRPA 1, 2, 3).** *Alternative 4 would not expose construction workers to hazardous materials present at the TKPOA Corporation Yard because no activities are proposed within this area under Alternative 4.* ***No impact*** *would occur.*

Alternative 4 would not expose construction workers to hazardous materials present at the TKPOA Corporation Yard because no activities are proposed in this area under Alternative 4. **No impact** would occur.

IMPACT 3.7-3 (Alt. 4) **Potential Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School (CEQA 3; TRPA 1, 2, 3).** *Under Alternative 4, some construction activities that involve the handling of hazardous or acutely hazardous materials could occur within one-quarter mile of a school. However, as described in Environmental Commitment 9, the school district would be notified regarding handling of hazardous materials related to the project before the EIR/EIS/EIS is certified. This impact would be* ***less than significant****.*

This impact is similar to Impact 3.7-3 (Alt. 1), although no activities are proposed within the Corporation Yard where the abandoned UST is located. This impact would be **less than significant**.

IMPACT 3.7-4 (Alt. 4) **Potential Increase in Public Health Hazards from Mosquitoes Resulting from Increased Floodplain Inundation (TRPA 3).** *Alternative 4 would result in more extensive floodplain inundation that could result in greater abundance of mosquitoes. However, as described in Environmental Commitment 10, the Conservancy would continue to coordinate with and support EDCVCD efforts to manage mosquito populations, and thus, not increase the potential for exposure of people to mosquito-borne viruses. This impact would be* ***less than significant****.*

This impact is similar to but greater than Impact 3.7-4 (Alt. 1) and less than Impacts 3.7-4 (Alt. 2) and 3.7-4 (Alt. 3), because Alternative 4 would cause a greater increase in the extent of floodplain inundation than Alternative 1 and a smaller increase than Alternatives 2 and 3. (For example, the 2-year streamflow event under Alternative 4 would inundate an additional 17 acres compared to an additional 12, 63, and 92 acres under Alternatives 1, 2, and 3, respectively [Conservancy 2006:A1].) Nonetheless, for the same reasons as described for Alternative 1, this impact would be **less than significant**.

IMPACT 3.7-5 (Alt. 4) **Potential for Airspace Safety Hazards Associated with Restoration and Enhancement of Habitat for Hazardous Wildlife (CEQA 5).** *Alternative 4 would restore or enhance habitat for hazardous wildlife in and near the approach/departure zone of the Lake Tahoe Airport. However, extensive habitat attracting hazardous wildlife already exists in the study area, and thus, Alternative 4 is not anticipated to substantially increase the attraction of hazardous wildlife. Also, the CLUP identifies management of timber, fish, and wildlife habitat, as well as SEZ restoration, as compatible land uses for the approach/departure zone. Furthermore, bird-aircraft collisions have not been occurring at the Lake Tahoe Airport, notwithstanding the presence of the Upper Truckee River riparian corridor habitat near the airport. Therefore, this impact would be* ***less than significant****.*

This impact is similar to Impact 3.7-5 (Alt. 1), but would be slightly less than under Alternatives 1–3 because the acreage inundated by a two-year streamflow event would be more than Alternative 1 but less than Alternatives 2 and 3, and unlike Alternatives 1 and 2, Alternative 4 would not create lagoon habitat. For the same reasons as described above, this impact would be **less than significant**.

IMPACT 3.7-6 (Alt. 4) **Potential for Wildland Fire Caused by Construction Equipment.** *During the dry summer season, sparks from on-site construction equipment could result in wildland fire. However, as described in Environmental Commitment 9, the Conservancy would develop and implement a fire prevention and management plan to minimize the risk of accidental ignition of wildland fires. Therefore, this impact would be* ***less than significant****.*

This impact is identical to Impact 3.7-6 (Alt. 1). For the same reasons as described above, this impact would be **less than significant**.

Alternative 5: No-Project/No-Action

IMPACT 3.7-1 (Alt. 5) **Potential Hazards to the Public from Use of Hazardous Materials (CEQA 1, 2; TRPA 1, 2, 3).** *As the No-Project/No-Action Alternative, Alternative 5 would not involve the storage, use, or transport of hazardous materials in the study area during construction.* ***No impact*** *would occur.*

As the No-Project/No-Action Alternative, Alternative 5 would not involve the storage, use, or transport of hazardous materials in the study area during construction activities. Thus, Alternative 5 would not create hazards to the public through routine transport, storage, use, and disposal of hazardous materials. **No impact** would occur.

IMPACT 3.7-2 (Alt. 5) **Potential Hazards to Human Health from Exposure to Existing On-Site Hazardous Materials (CEQA 2; TRPA 1, 2, 3).** *Alternative 5 would not expose construction workers to hazardous materials or create a health hazard.* ***No impact*** *would occur.*

Because the project would not be constructed under Alternative 5, this alternative would not involve any construction activities that could expose hazardous materials that could be present on-site. Thus, Alternative 5 would not expose construction workers to hazardous materials and would not create a health hazard by exposing and then leaving materials on-site. **No impact** would occur.

IMPACT 3.7-3 (Alt. 5) **Potential Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School (CEQA 3; TRPA 1, 2, 3).** *Alternative 5 would not expose hazardous waste or involve the handling of hazardous materials, substances, or waste within one-quarter mile of a school.* ***No impact*** *would occur.*

Because no construction would occur under Alternative 5, this alternative would not include construction activities that involve excavation that could expose hazardous waste potentially existing on-site. It also would not involve the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of a school. **No impact** would occur.

IMPACT 3.7-4 (Alt. 5) **Potential Increase in Public Health Hazards from Mosquitoes Resulting From Increased Floodplain Inundation (TRPA 3).** *Alternative 5 would not result in greater potential for exposure of people to mosquitoborne viruses.* ***No impact*** *would occur.*

As the No-Project/No-Action Alternative, Alternative 5 would not result in any physical changes to the study area. This alternative would not result in more extensive floodplain inundation or otherwise increase mosquito abundance. Therefore, it would not result in greater potential for exposure of people to mosquitoborne viruses. **No impact** would occur.

IMPACT 3.7-5 (Alt. 5) **Potential for Airspace Safety Hazards Associated with Restoration and Enhancement of Habitat for Hazardous Wildlife (CEQA 5).** *Alternative 5 would not create additional wildlife attractants or otherwise substantially increase the attraction of hazardous wildlife. Furthermore, bird-aircraft collisions have not been occurring at the Lake Tahoe Airport, notwithstanding the presence of the Upper Truckee River riparian corridor habitat near the airport.* ***No impact*** *would occur.*

As the No-Project/No-Action Alternative, Alternative 5 would not create any additional attractions to hazardous wildlife. Furthermore, as described under Impact 3.7-5 (Alt. 1), bird-aircraft collisions have not been occurring at the Lake Tahoe Airport, notwithstanding the presence of the Upper Truckee River riparian corridor habitat near the airport. For these reasons, **no impact** would occur.

IMPACT 3.7-6 (Alt. 5) **Potential for Wildland Fire Caused by Construction Equipment.** *Under Alternative 5, no project-related construction activities would occur; therefore, there would be no potential for sparks from on-site construction equipment to result in wildland fire.* ***No impact*** *would occur.*

This alternative would not involve any project-related construction activities that could spark a wildland fire. Therefore, **no impact** would occur.