SECTION 2

Project Description

2.1 PURPOSE AND NEED

The purpose of the Proposed Project is to restore natural geomorphic function and floodplain connectivity to the UTR within the Project Area, resulting in improved water quality and improved aquatic and terrestrial wildlife habitat. Specifically, the Proposed Project's goals are to:

1. Restore properly functioning channel configuration based on geomorphic principles;
2. Improve water quality by improving functionality of floodplain and reducing erosion;
3. Improve aquatic and terrestrial habitat;
4. Improve riparian and meadow vegetation;
5. Provide for appropriate and compatible public access opportunities;
6. Protect the natural environment of the UTR watershed;
7. Preserve and enhance the broad diversity of wildlife habitat in the Tahoe Basin; and
8. Provide aquatic habitat connectivity to upstream and downstream restoration projects.

Currently, the UTR within the Project Area exhibits signs of instability (i.e. channel incision [lowering of the bed elevation] and active bank failures) and degraded aquatic, riparian and meadow habitat. The river has been largely altered by historic and existing land use practices such as urban development, gravel mining, road building, bridge construction, airport location, sewer line installation, timber harvest, and grazing. As a result of past land use activities in the Project Area and elsewhere in the watershed, the UTR within the Project Area has an over-sized channel that requires greater magnitude flows to overtop the banks and flood the adjacent floodplain (i.e. a 2-5 year event is required to overtop the banks of the existing channel). Consequently, the frequency of overbank flooding and floodplain inundation has decreased, resulting in increased transport of sediment, nutrients, and pollutants to downstream reaches and Lake Tahoe, rather than deposition on adjacent floodplain meadows.

Incision and active bank failures have also resulted in a lowered groundwater table in the adjacent floodplain. The groundwater table is currently approximately 5-7 feet beneath the meadow surface late in the growing season. The lowered groundwater table has allowed for vegetation that is adapted to drier site conditions to replace the wet meadow vegetation, and has caused a seasonal disconnection between the roots of the streambank vegetation and the water surface level in the channel, leading to unstable streambanks. Channel alterations and the hydraulic impacts of incision have also resulted in a flat, sandy streambed with poor habitat for fisheries including spawning habitat and aquatic macroinvertebrates.

The project is an important element of the Lake Tahoe Total Maximum Daily Load (TMDL) implementation plan. The Final Lake Tahoe TMDL Report identifies stream channel erosion as contributing roughly 3.5% of the basin-wide fine sediment particle load to Lake Tahoe, and the UTR is identified as the source of 60% of this contribution (SWRCB 2010b). Stream restoration actions in the 3 largest contributing streams, UTR,

Blackwood Creek and Ward Creek, are estimated to reduce basin-wide fine sediment particle loads by roughly 2% within the first 15 years, and therefore are supported by the TMDL (SWRCB 2010b). The TMDL also acknowledges that these types of restoration projects have other environmental benefits such as rehabilitation of floodplains, riparian corridors and meadows, fisheries enhancement, and wildlife habitat restoration. In addition, restoration of the UTR through this reach has been identified as a priority project under the Lake Tahoe EIP (EIP #948 and EIP #908). Finally, the LTBMU Forest Plan provides direction on water quality improvement activities, including a standard and guideline to restore damaged watersheds and sites contributing to water quality degradation, with the priority for restoration in SEZs.

2.2 PROJECT LOCATION

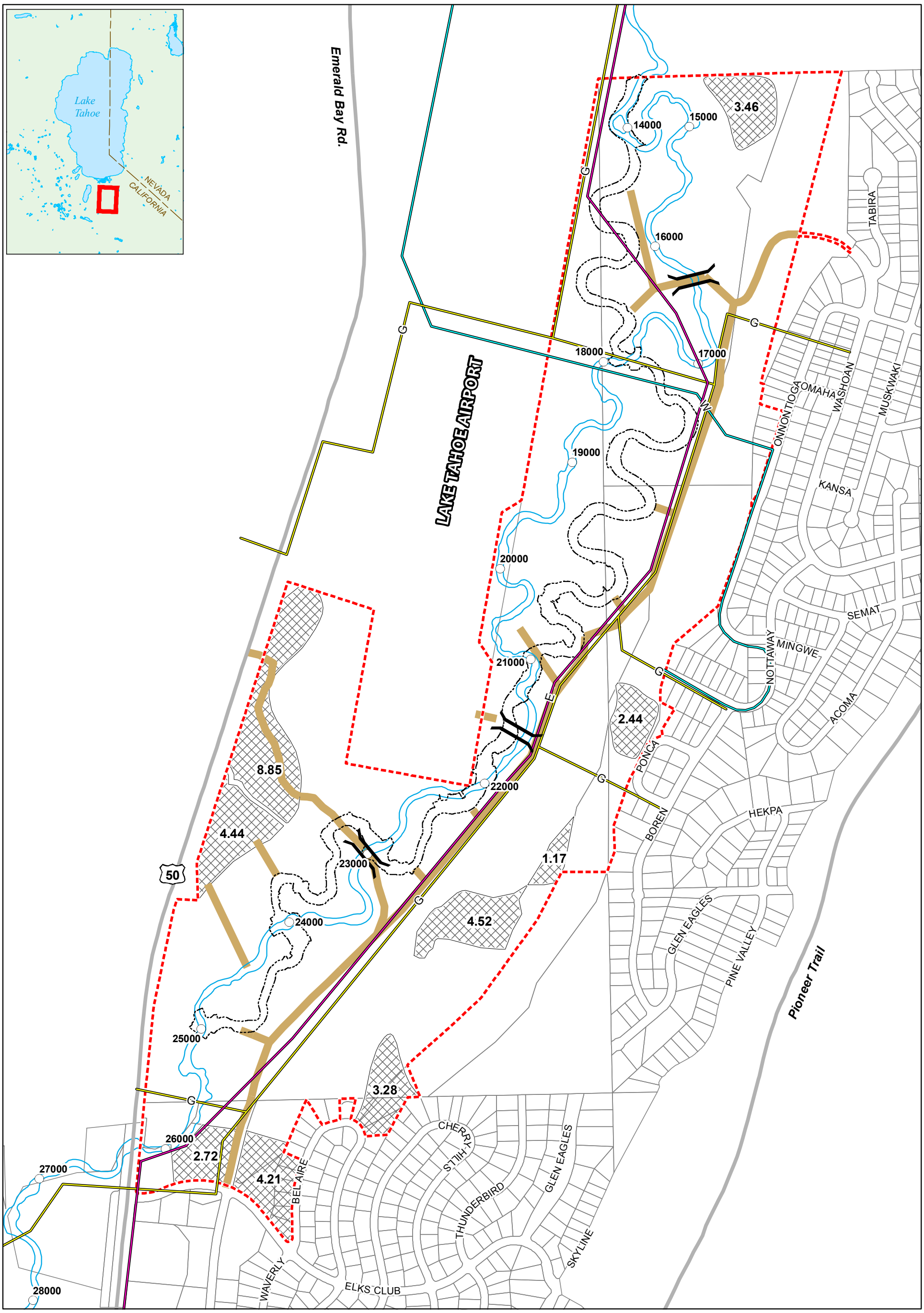
The Proposed Project is located within the "Sunset Stables Reach" of the Middle Reach UTR, near the City of South Lake Tahoe Airport (Figure 1-1). The Sunset Stables Reach is located south of Lake Tahoe in El Dorado County, California in the SW ¼ of section 12, T12N, and R18E of the United States Geological Survey (USGS) South Lake Tahoe Quadrangle map. The Sunset Stables Reach extends from the river crossing at ~~Hwy~~ U.S. 50 near Elks Club Drive northward to a point about mid-way along the airport runway. This reach includes two separate channel reaches of the UTR (Reaches 5 and 6), distinct from one another because of differences in physical channel and floodplain characteristics (Figure 1-2).

The Sunset Stables Reach is on land managed by the CTC and the USFS-LTBMU. The entire Sunset Stables Reach and the land surrounding the river through this reach encompass the Upper Truckee River Sunset Stables Reach Restoration Project, or the "Proposed Project." The distribution of land ownership in the Project Area is displayed in Figure 1-3 and Table 2-1. The majority of the Project Area is owned and managed by the CTC (approximately 221 acres, all of Reach 6 and part of Reach 5); and the USFS-LTBMU (approximately 69 acres, all within Reach 5), with about seven acres belonging to the City of South Lake Tahoe, other public agencies and private individuals. No project activities are planned for lands under private ownership ~~or owned by other public agencies~~. Under this Proposed Project, restoration would replace almost the entire existing Reach 5 channel with new channel and about three-quarters of the existing Reach 6 channel with new channel (approximately 12,000 ft of the existing 13,000 ft within Reaches 5 and 6 would be restored).

The UTR Sunset Stables Reach Restoration Project Area is approximately 297 acres. The land managed by the CTC includes the 189-acre Sunset Stables parcel and other smaller parcels, and includes approximately one–third of the existing Reach 5 and the entire existing Reach 6 channel. The CEQA analysis applies to the entire Project Area and to the Proposed Project as a whole. The NEPA analysis for this project applies strictly to the portion of the project managed by the LTBMU. The land managed solely by LTBMU includes approximately two-thirds of the existing Reach 5 channel.

Table 2-1 Ownership in Action/Project Area.

Landowner	Acreage	Stream Channel Length (linear feet)
California Tahoe Conservancy	221	7,200
USFS- LTBMU	69	5,200
City of South Lake Tahoe	4	620
Other public ownership	1	0
Private	2	0
TOTAL	297	13,020



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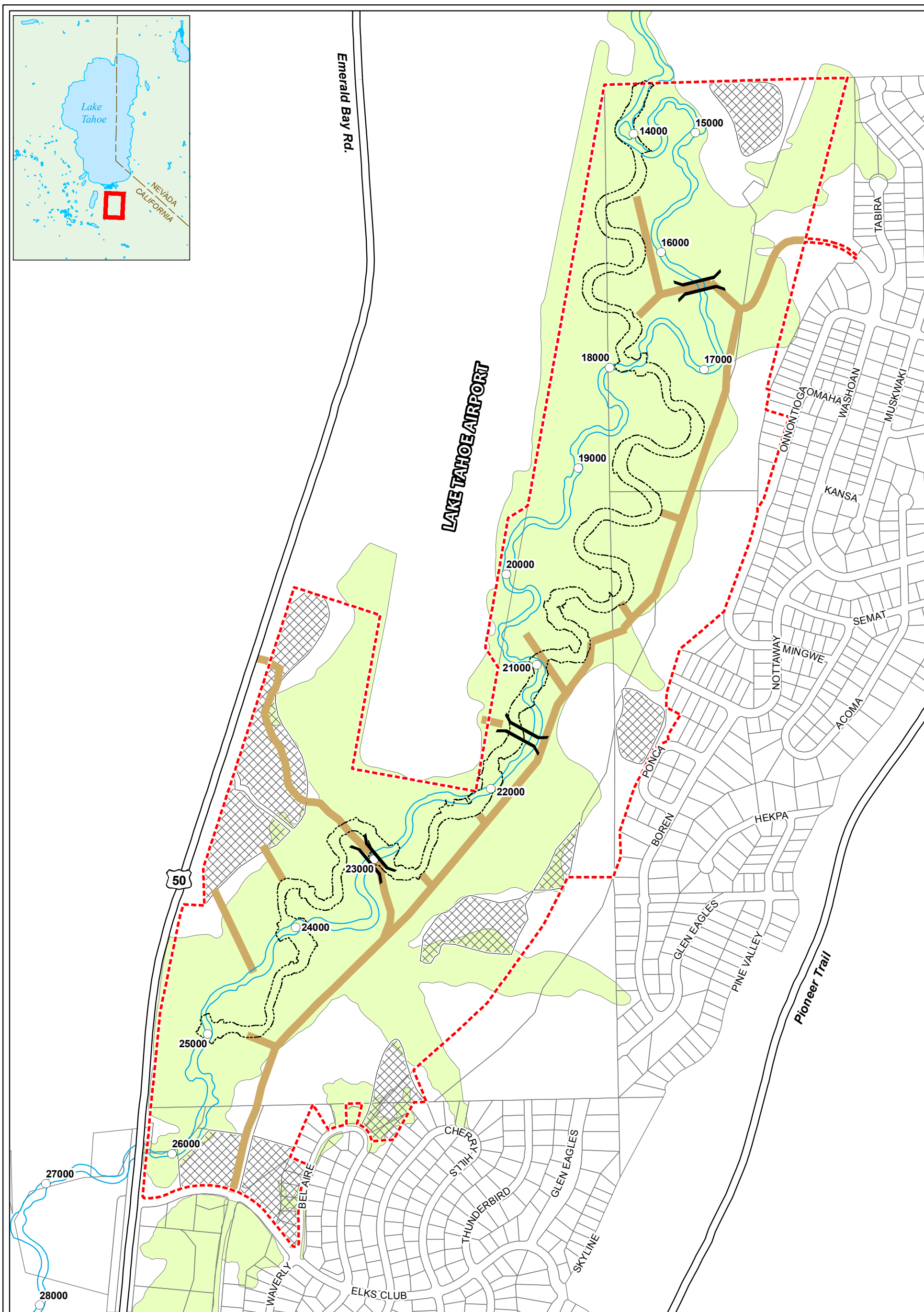

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2.3 BACKGROUND

The CTC and the LTBMU have been working as partners on the Proposed Project since 2006 and have worked collaboratively for project planning, management, and funding. The Proposed Project is directed by the Project Management Team (PMT) comprised of representatives from the CTC, LTBMU, the consultant (ENTRIX Inc.) and California Department of General Services-Real Estate Services Division (DGS-RESD), the contracting entity for CTC.

Downstream of the Project Area, the City of South Lake Tahoe is implementing a separate channel restoration project (Airport Reach). Construction on the Airport Reach project began in summer 2008, and construction activities will continue through 2011. Upstream of the Project Area, the California Department of Parks and Recreation is planning restoration of the river channel in Lake Valley State Recreation Area. Because the Project Area shares a boundary with these two projects, and the design and/or timing of construction activities of the projects may coincide, managers and design teams representing each project have and would continue to maintain very close coordination regarding monitoring, planning and implementation to avoid scheduling conflicts and the potential for overlapping construction impacts. Additional UTR projects are in planning stages in the Upper Truckee Marsh, adjacent to Lake Tahoe, and in Reaches 1 and 2 between the downstream crossing of ~~Highway~~ U.S. 50 and the downstream end of the Airport Reach.

2.4 ALTERNATIVES

This section describes and compares the five alternatives considered for the Project, defining the differences between each alternative and the process for developing the Proposed Project. The PMT and the TAG developed and evaluated five alternatives for restoring the river channel. The design parameters and hydraulic modeling to assess each alternative are available in the "Draft Conceptual Channel Restoration Design and Hydraulic Modeling Report" (CTC 2008c). Details of the conceptual alternatives, evaluation process, and selection of the preferred alternative are available in the "Final Alternatives Evaluation Memorandum" (AEM) (CTC 2008b) (PR Doc #B-3). Comparison of the alternatives was based upon the ability to meet design objectives and the feasibility of implementing each alternative considering environmental, social, and economic factors.

2.4.1 Alternatives Considered but not in Detail

The PMT and the TAG developed and evaluated five alternatives for restoring the river channel, including the No Action Alternative. In addition to the Proposed Project (aka "Full Channel Construction with constraints [Alternative 3])" in the AEM, PR Doc #B-3) and the No Action Alternative, three other restoration alternatives were considered, but eliminated from detailed study (CTC 2008b):

- **Restore Channel in Place (Alternative 1)** – Restore the channel in its existing alignment by using vertical grade control structures to increase aggradation and raise the channel bed. This alternative was eliminated by the PMT and TAG early in the planning process for several reasons: (1) the high risk of erosion and additional sediment transport from constructing in the active channel; (2) the use of untested methods for the entire stream reach (there are no known vertical grade control methods to raise the streambed that have been tested in similar Tahoe Basin systems); and (3) the long and uncertain timeframe for buildup of sufficient sediment to achieve the project goals of overbanking at the 1.5-year recurrence interval and improving aquatic habitat.
- **Full Channel Construction without Constraints (Alternative 2)** – Construct a new smaller channel for the entire Project Area (Reaches 5 and 6, approximately 12,000 feet of channel), assuming no constraints from existing utilities. This alternative (aka Alternative 2 in the AEM; PR Doc #B-3) was ranked lower than the Proposed Project and was therefore eliminated by the PMT and TAG early in the planning process for several reasons: (1) it would have triggered additional regulatory complexity and delay to

remove and/or relocate the STPUD pipelines; (2) significantly higher costs; and (3) it did not offer substantially more environmental benefits than the Proposed Project.

- **Half Channel Construction (Alternative 4)** – Construct a new smaller channel for the downstream half of the river (Reach 5, approximately 6,162 feet), and use vertical grade controls to aggrade the channel bed in the upstream half of the river (Reach 6). This alternative was ranked lower than the full channel restoration alternatives in the alternatives evaluation and was therefore eliminated by the PMT and TAG early in the planning process for several reasons: (1) it provided less environmental benefit than the Proposed Project (Alternative 3) or Full Channel Construction without Constraints (Alternative 2); and (2) the use of vertical grade control structures for aggradation in Reach 6 was considered risky.

2.4.2 The No Project Alternative (No Action, Alternative 5)

Under the No Project Alternative, the CTC property would be managed based on the direction of the current CTC programs' management activities. The NFS lands would be managed under the LTBMU Forest Plan (USFS 1988), as amended (including the Sierra Nevada Forest Plan Amendment [SNFPA] [USFS 2004]). No restoration would be implemented to accomplish the Proposed Project's goals. Targeted, small-scale erosion control measures and revegetation efforts would be implemented on an as-needed basis under existing land management programs of the CTC and LTBMU.

2.4.3 The Proposed Project (Alternative 3)

As described in detail in the following subsections (2.4.3.1-2.4.3.11) the Proposed Project would restore natural function to the Sunset Stables Reach of the UTR by constructing approximately two miles of new river channel that is geomorphically stable for the current hydrologic conditions, is hydrologically connected to the adjacent floodplain, and exhibits desirable aquatic habitat features (Alternative 3 in AEM; PR Doc # B-3) (Figure 2-1). A geomorphically stable channel is defined as a channel capable of withstanding floods and transporting sediment without either aggrading or degrading (Mulvihill *et al*. 2009 Kean and Smith 2005). Geomorphic stability also has been defined by Martin *et al*. (2007) as a theoretical construct when effective discharge and bankfull discharge have similar values. In addition, the former Sunset Stables site would be revegetated with native vegetation to reduce local erosion and sedimentation into the UTR.

The proposed restoration activities would result in a channel width, depth, and sinuosity pattern more consistent with the current flow and sediment transport needs of the river. This would be accomplished primarily through new channel construction, and would also involve abandoning, filling, and revegetating the existing eroding and incised channel. The newly constructed channel would be smaller, with a smaller width and depth, than the existing channel and would be designed to be more resistant to erosion by improving streambank stability and incorporating more variable channel bed substrate. The existing average width of the channel is 65 feet and the newly constructed average channel width would be approximately 39 feet; the existing average channel depth at riffle sites is ~~between 6 to 4~~ 5.4 feet and the newly constructed average channel depth would be approximately 3.9 feet. Remnant floodplain features, (channels and swales) would be connected to the new channel as appropriate.

The streambanks of the new channel would be stabilized with riparian vegetation planting, sod blocks, large wood, and/or rock placement. The new channel would be seasoned until revegetation success is determined adequate to prevent water quality degradation and sediment delivery prior to connecting it up to the river. Some portions of the Sunset Stables Reach channel would stay in their existing location and act as transition zones and/or grade control structures between Reaches 5 and 6, and between this project reach and upstream and downstream reaches.

The Proposed Project would involve:

- Constructing approximately 12,000 feet of new channel within the Sunset Stables Reach of the UTR (replacing nearly all of Reach 5 and much of Reach 6).
- Planting and temporarily irrigating native riparian vegetation along both sides of the new channel (approximately 24,000 linear feet).
- Creating floodplain features such as willow clumps that enhance suitable habitat for key wildlife and plant species (up to 20 acres distributed across the Project Area).
- Removing conifers in and adjacent to the newly constructed channel and along the access road where necessary (approximately five acres affected by conifer removal throughout the Project Area).
- Using a combination of excavated soil from the new channel alignment and possibly imported soil to ~~partially~~ fill the abandoned oversized channel, and revegetating disturbed areas with native plant species (majority of the existing, abandoned channel would be filled and revegetated in this way).
- Installing grade control structures at the upstream and downstream ends of each reach, redirecting flow into the new channel, and blocking off the existing channel to prevent recapture.

In order to minimize potential impacts on existing infrastructure, the alignment of the new channel was designed to avoid the paralleling sewer pipelines where feasible. The STPUD holds easements for location and access to its sanitary sewer collector lines (gravity-fed), water line (pressurized line), and back-up effluent export line (also called "force main export line") within the Project Area. The back-up effluent export line enters the Project Area from the north adjacent to the airport and then crosses the meadow and river at existing RS 17000 (RS = River Station), and runs along the east side of the meadow to the south end of the Project Area (Figure 2-1).

Currently, it is anticipated that each of these lines would still cross the new river in this approximate location in Reach 5 after project implementation; however, this is dependent on the final alignment of the channel determined during development of the Final Design Plans. Two gravity collector lines cross the river near existing RS 17900 and 24700, and a water line crosses the river near the existing RD 18000. The Proposed Project would be implemented under close coordination with STPUD where construction activities have the potential to affect these lines (see section 2.4.3.2 for specific description of how these pipelines would be protected).

The Proposed Project would be implemented in two phases to accommodate constraints in agency ownership, funding and construction: Reach 5 (LTBMU and CTC lands) and Reach 6 (CTC land). At this time, Reach 5 is anticipated to be implemented first, followed by Reach 6 implementation. Each phase would last approximately three to five years in order to allow sufficient time for the new channel and disturbed areas to become established with vegetation. As currently planned, the construction sequence for Reaches 5 and 6 would occur over four to ten ~~eight~~ years, depending on the funding and permitting schedule. The envisioned sequencing is as follows:

First, the infrastructure would be built to support project construction, including staging and materials storage areas, access and haul roads, and temporary river crossings. Figure 2-2 identifies the proposed new haul routes within the SEZ. Next, new channel excavation would begin, including modifying the meadow to reconnect old overflow channels with the new channel as appropriate. Banks and bordering meadow would then be revegetated with vegetation harvested from nearby sources (e.g., sod blocks and willows), and irrigation systems would be installed and operated where necessary to assist in revegetation success. Irrigation and revegetation efforts would continue until revegetation success is determined adequate to prevent water quality degradation and sediment delivery by implementing and regulatory agencies. Once revegetation

efforts are determined to be successful, the connecting channel segments would be excavated at tie-in locations for the existing and new channel locations. The new channel would be flushed to remove fines from the channel or percolate fines into the substrate. Turbid water would be pumped from the new channel and either ~~spread~~ dispersed on the floodplain or upland dewatering sites, or otherwise treated prior to release to the river. Dewatering activities will be monitored closely to ensure that surface flow and meadow saturation is avoided.

The new channel segments would then be tied into the river up and downstream. The lateral grade controls would be constructed at the tie-ins to prevent the river flow from re-occupying the old channel. Finally, the abandoned old channel would be filled with stored spoil material, imported material and/or material used for access and haul roads as they are abandoned and become available. Fill in the old channel would be recontoured to mimic existing meadow elevations as appropriate, and revegetated and irrigated, if necessary. Access and haul roads and river crossings would be removed and storage and staging areas would be recontoured and restored prior to demobilizing the site.

As part of the Reach 5 channel restoration, the STPUD water line at RS 99+00 and effluent export line at RS 117+00 would need to be lowered where they would cross the new river channel ~~on NFS lands~~. Lowering the STPUD waterline and effluent export line at these crossing locations would provide adequate clearance between the bottom of the channel and the pipes, as determined by STPUD. This would most likely be completed in Year 1 or 2 of Reach 5 implementation, but could be completed during any construction year.

The implementation sequencing would be very similar for both Reach 5 and 6 however; the final tie-in stage of construction for the two reaches would be staggered by at least one year, to reduce the potential for effects (see Chapter 3) if multiple reaches were connected to the UTR flow in the same year. If all channel construction work in each reach is completed in the first year, implementation of each phase could be completed in three years. On the other hand, if channel construction carries over into the second year and/or the bank vegetation is not adequately established after one year of seasoning, the project phases may take up to five years to be completed. Depending on the start date of Reach 5 and Reach 6 construction and the rate of vegetation establishment, the Proposed Project could be completed in four to ten years.

The following sections provide greater detail on the construction of the Proposed Project. The description of the Proposed Project is based on the 50% design plans dated December 5, 2008 (Appendix E).

2.4.3.1 Construct new stream channel

Approximately 12,000 linear feet of new, smaller river channel would be constructed within the constraints of existing water and sewer lines and property easements (Figure 2-1). The length and sinuosity of the new channel would be similar to the existing channel, which has not substantially changed planform since 1940. The new channel in a riffle section is designed to be narrower and shallower than the existing channel, resulting in a capacity of about 450 cubic feet per second (cfs) (~1.5 year flow event). Flows above 450 cfs would overtop the banks and inundate the meadow. The top of banks have been designed to be as close to the existing ground level as possible while maintaining the design slope to reduce excavation. This design would increase connectivity of the channel and floodplain.

Overall, the new channel would come off the existing Reach 6 channel at about RS 25000 (upstream end) and tie back into the existing Reach 5 channel at RS 13700 (downstream end). The new channel would start approximately 1,400 feet downstream of the ~~Highway~~ U.S. 50 bridge near Elks Club Drive and about 600 feet downstream of a gravity sewer line crossing in order to improve project feasibility and cost effectiveness and to reduce the potential for flooding impacts upstream. The new Reach 6 channel would connect to the existing channel near the reach break between Reaches 5 and 6 where the channel is generally narrower and shallower, characteristics similar to those of the proposed new channel. The existing channel segment near the reach break between Reaches 5 and 6 (approximately 200-400 feet) would be altered in place (e.g. with bank stabilization features) to maintain sediment transport continuity between the two new channel segments. This

may entail narrowing the existing channel by using a combination of rock, wood, and vegetation to reduce existing channel capacity and assure suitable sediment transport, and habitat values. The new channel excavation will occur in contiguous segments between crossings of the existing channel and/or crossings of the buried utility lines. The unexcavated material and meadow surface will act as trench plugs at the upstream and downstream ends of each constructed segment to separate the new channel from the river flow. During excavation of the new channel, some recontouring of the floodplain to connect abandoned floodplain features such as remnant channels or swales to the new channel would occur, as appropriate. In Reach 5 the new channel would come off the existing channel near RS 21000 and tie back into the existing channel near RS 13700. Following construction and seasoning of the new channel, a total of approximately 11,200 linear feet of existing channel would be abandoned and backfilled.

After each segment of channel is excavated, bank stabilization measures will be installed, including but not limited to the use of native vegetation (See section 2.4.3.4 and 2.4.3.5 for more detail), wood and/or rock structures where more hardened bank protection is needed, and erosion control fabric with seeding and willow staking. The channel bed in constructed riffles will require installation of gravel to maintain the channel elevation over the long-term. Because this material is not readily available in the project site, most or all of the riffle substrate will be imported into the project area. Imported gravel will be washed prior to use in the channel, and will be rounded to imitate natural channel substrate.

Conifers in the path of the new channel or the access and haul roads would be removed prior to channel construction. These trees may be pushed over rather than cut off at the ground surface so that the entire tree and root bole would remain intact for use in the new channel banks or on the floodplain surface.

Excavated material would be stockpiled and BMPs (Appendix F) would be implemented to reduce erosion during the storage period. Stockpile areas would be assessed by a certified LTBMU botanist, and either determined to be weed-free before being used, or existing invasive plants would be treated and/or covered before using the area for soil and other material storage. A noxious weed risk assessment was done for the Project Area based on surveys conducted in 2004, 2005 and 2008 (ENTRIX 2009b) and is available as part of the project record (PR Doc #K-4) (Appendix G). The area selected for stockpiling (at the site of former Sunset Stables buildings) would be paved or treated through installation of an asphalt base pad.

Any groundwater intercepted during new channel excavation would be pumped from the active construction area and spread/sprinkled on the floodplain or at designated upland sites.

See the revegetation section (Section 2.4.3.5) below for bank stabilization and seasoning details.

2.4.3.2 Protect water and sewer lines

As part of the channel restoration in Reach 5, the Proposed Project would modify the STPUD water line and effluent export line where it crosses under the new river channel (RS 99+00 and 117+00 respectively on the new channel alignment). ~~The crossings occur on NFS lands (Appendix E).~~ The waterline and effluent export line crossings would be modified by lowering the elevation of the pipes where they cross the channel so the pipes have adequate clearance below the bottom of the channel, as determined by STPUD. The lines would be temporarily shut off and drained prior to construction after Labor Day when deliveries in the water line are minimal. The channel above the pipe would have a natural bed form. Engineered riffles in the new channel would be designed to allow sufficient depth for passage at low flows.

In addition, where the new channel gets close to the STPUD buried utilities, additional protection measures would be used to prevent the channel from moving laterally in these areas to protect the utility lines. Due to the potential for impacts to existing utility lines if the channel were to move laterally and undercut and impinge on the existing lines, the new channel banks will be armored with buried rock protections, or another suitable protection measure approved by the STPUD in strategic locations where this risk exists.

2.4.3.3 Install vertical grade controls

Vertical grade control structures such as boulder weirs or gravel/cobble riffles would be installed in at least four locations for a few hundred feet in the transition areas between the old and new channel sections to provide a stable hydraulic transition. These transitions include: (1) the transition point between the existing Reach 6 and new Reach 6 channel, (2) the transition from the new Reach 6 channel into the channel between Reaches 5 and 6, (3) another transition between this channel and the new Reach 5 channel and, finally, (4) the transition point between Reach 5 and Reach 4, where the City of South Lake Tahoe commenced construction in late summer 2008 of the "Upper Truckee River Restoration Project, Middle Reaches 3 and 4" (also known as "Airport Reach"). Both project teams are coordinating planning and design to ensure a smooth transition between the two projects at their boundary between Reaches 4 and 5.

2.4.3.4 Install natural materials for instream cover

Aquatic habitat would be enhanced by increasing cover along the banks with vegetation or woody debris. Banks would be protected with treatments including, but not limited to stacked sod, brush mattress, root wads, large woody debris, engineered log jams, rock or other site-specific treatments as appropriate. Brush mattresses would be constructed from willows and secured with wire. The objective is to complement riparian plantings of willows and other vegetation in providing bank cohesion and fostering the development of pools and banks with habitat providing cover. Such treatments would be placed at locations and at a frequency appropriate to the channel design, taking into consideration topography, bank structure, aquatic habitat type and meander bends. Woody debris would be most appropriate at the upstream end of outside bends or other locations on the main channel where pools are desired.

Wood structures would be designed to withstand the design flow. Where wood structures are installed along the new channel banks, the use of cabling would be avoided, and the extent of excavation into the existing undisturbed meadow would be limited to the extent feasible. Rather than cabling the logs in place, wood structures would be anchored by embedding them into the banks and keying ~~them~~ the logs into each other to result in a more natural appearance. Logs would either be anchored by rocks, other logs, existing meadow soil and vegetation; or would be fully submerged and wet at all flows.

2.4.3.5 Revegetate channel and meadow

Revegetation would serve to stabilize the new banks and help reduce erosion, enhance riparian and meadow habitat, and enhance aquatic habitat in Reaches 5 and 6 by providing overhead cover along the channel margins. After excavation of the new channel, riparian vegetation would be planted along portions of both banks of the new channel (approximately 12,000 linear feet of channel/24,000 linear feet of bank). Willows salvaged from the abandoned channel would be planted in clumps in suitable locations along the new channel or the meadow, which would help increase floodplain roughness and enhance sediment deposition, as well as restore riparian scrub and meadow habitat.

Plants used in the habitat restoration would be developed from locally collected native seed (where feasible) and plant materials. Willow species such as *Salix lemmonii* and *Salix geyeriana* occurring in areas of new channel construction would be pruned, carefully excavated, and stored to be transplanted along the new channel during construction. The pruned cuttings would be stored wet. Willow cuttings, posts, poles and container plants would be utilized to establish willow riparian habitat. Sod consisting of sedges (*Carex* sp.) and other herbaceous vegetation would be cut in blocks and either transplanted immediately if the site is prepared or stored wet until replanting. Harvested sod would consist of above ground and below ground plant materials including leaves and roots, and the soil bound by the root mass. Sod harvest areas outside of the new channel alignment would be seeded and irrigated to promote revegetation success. Seed mixes for vegetating open disturbed areas on the meadow and channel banks would be derived from similar wet meadow areas.

As discussed earlier, conifers in the path of the new channel or access roads would be removed prior to channel construction. Tree removal, especially the removal of large diameter trees (>24" diameter at breast height [dbh]), would be limited to the minimum necessary to implement the Proposed Project. The removed conifers would be chipped for mulch or salvaged for possible use as coarse woody debris in the channel or on the floodplain. The mulch would be used to create an organic layer in disturbed soil areas, to control weeds, and to conserve soil moisture around installed plants and cuttings. Erosion control blankets of coir fabric and possibly mulch (e.g. pine needles or wood chips) may be utilized in some locations to prevent erosion and gullying while the riparian vegetation takes hold.

Willows and sod (as available) would be transplanted on the new banks and selected meadow areas near the channel to jumpstart revegetation. The existing ground would be scarified as needed to facilitate revegetation. If necessary, soil amendments would be applied and incorporated into the soil. Willow poles would be driven into the soil to a depth where moist soil is reached (at least one foot deep or more, depending on groundwater levels). Some cuttings would be used as stakes to anchor bank treatments along the new channel. In suitable portions of the meadow, willows would be planted to create clumps and expand existing willow habitat.

All revegetation areas would be irrigated during the dry season to help with vegetation establishment and success. Based on estimates of application rates and area of irrigation it is anticipated 0.05cfs would be used for up to four hours per day. Water used for irrigation will be drafted preferentially from the newly excavated channel and secondarily from the existing UTR channel. Pump intakes will be screened to prevent capture of aquatic species and given that the minimum flows in the UTR would be approximately 10cfs, the drafting of 0.05cfs would be minimal and have inconsequential effects on instream flows.

Irrigation and revegetation efforts would continue until revegetation success is determined adequate to prevent water quality degradation and sediment delivery by implementing and regulatory agencies. This could be one to three growing seasons.

2.4.3.6 Flush new channel of fine sediment and prepare to connect new channel to the river

The newly constructed channel would remain separate from the existing river channel for one to three growing seasons to "season" the channel (i.e. allow consolidation of materials and establishment of new riparian vegetation). "Seasoning" of the bank treatments could take additional time, depending on revegetation success. When the revegetation efforts along the channel and floodplain are determined to be adequate to ~~protect~~ prevent water quality degradation and ~~prevent~~ sediment delivery by the implementing and regulatory agencies, the new channel would be connected up with the live river in late summer during the annual period of lowest channel flow (i.e. baseflow, approximately 10-20cfs).

Prior to connecting new channel segments up with the existing channel, the new channel segments would be flushed with water pumped from the river to remove fines from the channel or to percolate fines into the substrate. Flushing would proceed from upstream to downstream in each new channel segment. Turbid water would then be pumped from the new channel and spread on the floodplain or at upland dewatering sites. Dewatering activities will be monitored closely to ensure that surface flow and meadow saturation is avoided. Should the capacity of the identified dewatering sites be exceeded, UTR flows would be diverted around the new channel construction area until capacity is restored or other measures are introduced to handle the additional turbid water (e.g. Baker tanks, sediment bags, filtration system, etc.).

Once this initial flushing is complete, rescue and relocation efforts would be implemented for fish and invertebrates in the existing channel, then the river flow would be diverted around each segment while the trench plugs (soil and sod left to separate the new channel from the existing channel) are excavated. As part of the fish rescue and relocation, warm water invasive fish species encountered in the channel will not be returned to the river and will be eradicated. A portion of the flow would be routed into the new channel segments following installation of lateral controls (Section 2.4.3.7) to again flush the new channel prior to full connection with the river. This water would be contained in the new channel using coffer dams or a similar

temporary dam, and pumped and spread onto meadow surfaces or designated upland sites. Water quality at the downstream end of the new channel would be pumped and spread as described above until it is in compliance with permit requirements prior to releasing water back into the existing channel.

2.4.3.7 Install lateral grade controls and connect the new channel to the river

Lateral grade controls would be installed in the bank at each location where the new channel crosses or ties into the old channel to prevent the recapturing of the old channel by river flows. A total of approximately 14 lateral grade control structures would be installed for the Proposed Project, six for Reach 5 and eight for Reach 6. The locations would depend on the final channel alignment. Where the new channel leaves or rejoins the existing channel, one lateral grade control would be installed (upstream end of Reach 6, two transitions between Reaches 5 and 6, and downstream end of Reach 5, totaling four structures). Where the new channel crosses the existing channel, two lateral grade controls would be installed (six locations, totaling twelve structures). These structures need to be constructed adjacent to a live stream and thus cannot depend on revegetation and seasoning to establish erosion resistance. Lateral controls would be composed of a rock or wood footing along the active channel and buttressed by sod blocks and fill as the rock or wood structure is constructed. The structure is raised to an elevation slightly above the elevation of the floodplain as a precaution to prevent recapture. A combination of engineered and bioengineering techniques would be used to permanently stabilize the structures. Riparian vegetation (e.g., stacked sod and/or willow mattresses) would be placed along the lateral control structures to provide a more natural bank appearance and function. The new channel would then be connected to the river up and downstream of each new channel segment. Finally, all river flow would be diverted into the new channel.

2.4.3.8 Backfill old channel

Once Reach 5 and 6 channels are constructed and re-watered, the old channel (approximately 11,200 linear feet) would be backfilled, recontoured and revegetated. The Proposed Project will excavate approximately 62,000 cubic yards (y^3) of material from the new channel and import a total of about 30,000 y^3 of material[1]. The existing channel would be backfilled using material excavated from the new channel, the encapsulated road base material, and additional imported backfill material. The old channel would need an estimated 82,000 y^3 of fill to fill it to the level of the existing meadow. The new channel would have a smaller width and depth than the existing channel (see Section 2.4.3 above), so the excavated material would be insufficient to fill the larger volume of the old channel. With the 62,000 y^3 of soil excavated from the new channel and the 10,000 y^3 of road base from the encapsulated roads, there would be about 72,000 $y^3$of fill material available to fill the old channel. Therefore importation of an additional 10,000 y^3 of material would be needed to fill the old channel to the level of the existing meadow[2]. Some portions of the existing channel may be only partially backfilled to reduce the amount of imported material needed and allow for seasonally wet areas on the floodplain after project completion. Figure 2-2 identifies the proposed new haul routes within the SEZ. As the road is being removed, this material could be used to supplement native material for filling the existing channel, but would be topped with native material to act as suitable planting media. All potential sources of additional fill would be assessed and would be certified by an LTBMU botanist as weed-free. Necessary steps would be taken to ensure that invasive weeds or contaminants are not introduced into the Project Area, either by treating the fill source (i.e. weed eradication prior to use) or selecting a different source. Where there is insufficient fill to completely backfill the existing channel, some portions of the former channel would be recontoured into shallow swales that would drain naturally and not retain permanent ponds through the summer, in order to avoid creating habitat for waterfowl or bullfrogs. Recontouring would also be used to enhance connectivity during overbanking events between the new channel and some historic channel features

[1] Including about 10,000 y^3 of road base for the encapsulated roads, plus 10,000 y^3 of gravel and cobble for new channel bed material and bank material, and another 10,000 y^3 of material that will be needed to completely fill the old channel. Gravel and cobble material for the new channel is estimated by multiplying the entire length of the new channel (12,000 feet by an average of 30 feet wide for the seventy percent of the channel that is not pools = 252,000 ft^2 and multiplying the square feet by an average of one foot of substrate placed onto the new bed (=252,000 ft^3) and dividing this by the 27 ft^3 in each cubic yard (=9,333 y^3) This amount is then rounded up to 10,000 y^3.

[2] A potential source of imported material to fill the old channel could be the Bijou Area Erosion Control Project in the City of South Lake Tahoe.

(i.e. meadow swales and remnant channel segments). All disturbed sites would be graded to match natural contours and revegetated.

2.4.3.9 Restore former Sunset Stables site

Restoration of the former Sunset Stables site is specific to the CTC lands and will be subject to analysis under CEQA only. Restoration of the site would improve water quality by reducing erosion from the uplands, as well as enhance upland habitat. The buildings of the former Sunset Stables operations (stable, barns, shop and ranch house) were once located in the bare areas visible near ~~Highway~~ U.S. 50. This area was previously modified by grading to create relatively flat topography. The site is on an alluvial fan that extends from Twin Peaks toward the UTR. The original water supply pump house is still present and operational. A graded dirt road extends along the eastern edge of the old Sunset Stables site. A water line, sewer line and septic tank were encountered in this site during a geotechnical survey (CTC 2005b).

During construction of the new river channel, this site (approximately 13 acres) would be used to stockpile soil excavated from the new channel, prior to backfilling the old channel. All potential staging areas and sources of fill would be assessed and certified by LTMBU botanists as being weed free before being selected. Steps would be taken to ensure that weeds or contaminants are not introduced into the restored SEZ area, either by treating the fill source or staging area (i.e. weed eradication prior to use) or selecting a different source/site.

Once this site is no longer needed for stockpiling, the building pads and disturbed areas would be recontoured and prepared for planting. Soils would be tested for nutrients and, if necessary, treated with soil amendments prior to planting. In addition, coarse woody debris would be placed as appropriate within the site to create additional structure, assist with erosion control, and aid in medium and long-term soil development. The site would be revegetated with native species typical of upland conditions, including basin sage, rabbitbrush, and Jeffrey pine. This revegetation would serve both to stabilize the soil and to restore native habitat. Plantings would include native trees, shrubs, grasses or herbaceous plants appropriate to the soils and hydrology. Stock for revegetation would be developed from locally collected seed and plant cuttings. Irrigation would likely be provided from the water supply pump house still functioning on the site.

2.4.3.10 Additional Construction Details

Construction season

Active construction would be conducted primarily during the grading season for Lake Tahoe, most likely from June through mid-October (approximately 175 days without any extension), when soil moisture conditions in this project area are favorable for construction. The project site would be closed and all exposed soil areas would be stabilized, with BMPs installed for over-wintering, each year prior to the grading deadline, October 15th, or a later date as determined by a grading extension through TRPA and the Regional Board.

Access and staging

Construction access would be from the location of ~~the former Elks Club and~~ the former Sunset Stables site adjacent to ~~Highway~~ U.S. 50, potentially across the airport runway based on agreement with the City of South Lake Tahoe (CSLT) and airport staff, and to the river channel from the main access roads (light access). In selected areas, a temporary, 12- to 14-foot wide access roadway would be installed to control erosion where the heaviest construction would occur and to provide access to the new river channel. Wide areas used as pullouts would also be constructed along this roadway to allow two-way truck traffic for flexibility and in the event of an emergency. Up to three temporary crossings/bridges would be constructed to transport materials across the river and would be designed to avoid impacts to and prevent interaction with the channel. The

temporary crossings/bridges would be designed with BMPs adjacent to them to prevent sediment discharges to the UTR (see GHWQ-5 in section 2.4.3.11).

Several construction staging areas would be established. The ~~largest~~ staging area~~s~~ would be located at the Sunset Stables property (approximately 13 acres). However, according to Figure 2-1 there are approximately 30 acres devoted to staging and dewatering which was used for the worst-case scenario. It is probable that only 4 to 6 acres of that 30 will be used for staging (mostly for equipment and materials storage). ~~The Elks Club staging area in the southern portion of the Project Area is within 200 feet of residential areas on Bel Aire Circle and Cherry Hills Circle and the site is also on a 100-year flood plain and therefore will not be used for staging or stockpiling.~~ However, this area may be used for parking, dewatering, or for emergency access.This would avoid the risk that high flows from the UTR could inundate stockpiles and discharge soils to nearby surface waters and avoid potentially disturbing any nearby residents.

The Sunset Stables staging area is approximately 2,400 feet from the nearest residential area. The staging and storage area would be graded and may be temporarily resurfaced with gravel or possibly temporarily paved (approximately 4,404 cubic yards of materials), as needed. Adjacent land uses include wildlife habitat and transportation and utility corridors. This area would be used for stockpile and storage of material, equipment storage, equipment laydown, workshops, office trailers, restrooms, and employee parking. During restoration, ~~they~~ it would be used to store and prepare containerized plants before planting.

Several smaller staging or storage areas (approximately three to six acres each) would be constructed as needed throughout the construction zone for temporary staging and storage of equipment and materials, and as dewatering areas. The locations of these smaller staging areas are shown in Figure 2-1. Both construction access roadways and staging areas would be located to minimize loss of trees and other vegetation.

Disturbed site rehabilitation

Areas disturbed during construction such as staging sites and access roads would also be revegetated at the end of project implementation, as needed. In addition, at the end of each construction season, cover would be provided and other BMPs installed as necessary to stabilize the sites (including staging areas and access roads) for the winter season. In areas disturbed by construction and access activities, mulch or other adequate ground cover would be provided for over-wintering after each construction season, and native seed mixes would be broadcast after the final construction season to provide vegetated ground cover over the long term. Hydrostraw, mulch or another alternative would be applied to reduce erosion and protect young vegetation. Restored areas would be actively maintained for three years after construction. Maintenance measures would include irrigation of newly planted vegetation and implementation of the Noxious Weed Risk Assessment requirements (for NFS lands) or the Invasive Weed Management Plan (for CTC lands), as applicable.

Extend power and other utilities to construction site

Power requirements would be 220 volts for a Contractor office trailer, as needed. Most of the power required during construction would be used to operate the office trailer, although the Contractor/USFS may elect to operate some water pumps with electricity. This power and the construction of the valve vault or single post facility would be provided by Sierra Pacific Power Company (SPPC). If the SPPC-supplied power line was not in place to provide power, portable generators would be used temporarily.

Site preparation and clearing

The construction site would be prepared for construction by clearing and removal of vegetation from the construction area. Conifers in the path of the new channel would be removed prior to channel construction. Conifer removal would occur in up to approximately two acres along Reach 5 and up to about 1.5 acres along Reach 6 (based on an estimate for an 80 foot-wide band where the proposed alignment passes through forest). In addition, individual conifers would be removed along the alignment of the access and haul roads if

necessary (up to 1.5 acres). In Reach 6, tree removal would be minimized to preserve the wildlife movement corridor. The actual number of trees to be removed would be verified in field surveys for the final channel alignment. Trees and tree stumps would be moved but would be stored for use in habitat creation and restoration.

Brush, slash, timber, and removed stumps not used for habitat restoration would be chipped for mulch or otherwise disposed of in accordance with local restrictions and regulatory requirements. Rock uncovered during channel excavation would be retained on-site for potential use for stream bank stabilization where allowed by applicable permits.

Noxious weed control

The majority of noxious weeds populations within the Project Area are associated with areas of disturbance and/or human activity including trails, roads, parking areas, and stream banks. Any new disturbance (i.e., road building, excavation, etc.) will provide an opportunity for noxious weeds to spread. A detailed description of the life history characteristics of these species was provided in Appendix C-3 of the Existing Conditions Report (CTC 2004a) for the Proposed Project. A general description of the occurrence of each invasive plant/noxious weed species found in the Project Area is provided below and is also included in the Noxious Weed Risk Assessment (ENTRIX 2009b; PR Doc # K-4; Appendix G).

Noxious weed populations have been identified in the Project Area from surveys conducted in 2004, 2005 and updated in 2008 including:

- Cheat grass (*Bromus tectorum*) - 15 populations of this species were observed in the Project Area in 2004 and 2005, and an additional 32 populations (including new populations and significant expansions of existing populations) were surveyed in 2008. Infestations occur at the Sunset Stables areas near the former ranch buildings and storage areas, the STPUD alignment located near the south end of the Project Area, the Elks Club site, and a few other isolated sites;
- Bull thistle (*Cirsium vulgare*) - nine populations of this species were found in the Project Area in 2004 and 2005, and an additional 13 populations were mapped in 2008;
- Ox-Eye Daisy (*Leucanthemum vulgare*) - 10 populations were found in 2004 and 2005, 12 additional populations were mapped in 2008;
- Klamath weed (*Hypericum perforatum*) - two populations of this species were found in the Project Area in 2004 and 2005 with only one additional population identified in 2008;
- Woolly mullein (*Verbascum thapsus*) - 19 populations of this species were found in the Project Area in 2004-2005 with 11 more populations and/or significant expansions of existing populations recorded in 2008. Populations occur along the existing UTR channel, notably near the northern project boundary, near the center of the Proposed Project adjacent to the airport, and along the river channel from the ~~Highway~~ U.S. 50 bridge downstream for about 2,500 feet.

Noxious weeds would be controlled by following standard practices, as detailed in Section 2.4.3.11 (WEED-1 through WEED-8). No surveys for aquatic weeds have been conducted in the project area. If aquatic weeds are found during project implementation, drafting sites would be located outside of the weed infested areas.

Protect the existing channel during construction

The existing river channel would be protected from construction related impacts by keeping the majority of flows within the existing channel during construction of the new channel and restricting flood flows from direct access to the active construction area. BMPs would be installed at locations where the new channel approaches and crosses the old channel in order to prevent bank failure and erosion after construction and during the seasoning of the new channel.

BMPs include practices such as leaving unexcavated earthen barriers between the existing channel and the new channel segments to physically separate them. Typically, these barriers consist of unexcavated material

left at the end of the newly excavated channel, and perhaps backed-up by sod blocks, compacted subsoil or sandbags placed across the end of the excavated channel. In addition, BMPs for protection of the construction area during storm and flood events may also include, but would not be limited to water filled berms, coir logs, and/or silt fencing to isolate disturbed construction areas from active flood flows.

2.4.3.11 Design Features and Construction Controls

This section describes the features that have been incorporated into the Proposed Project's design, construction, and operation in order to protect sensitive resources and to avoid and minimize impacts on those resources. Design features, construction controls and other BMPs have been built in to correct short-term impacts and avoid long-term impacts to air quality, biological resources (i.e. vegetation, wildlife, fisheries), cultural resources, geology, hydrology and water quality, hazards and hazardous materials, noise, recreational resources, traffic and circulation, utilities and greenhouse gases. Site conditions may vary seasonally, and therefore a particular BMP approach may require adjustments depending on how site conditions vary over time. A brief description of the anticipated disturbance to each of the affected resources, and the design features developed to prevent impacts to that resource, is as follows:

Air Quality

The following design features and construction control measures are proposed to reduce effects to air quality from project activities:

AQ-1 Water exposed soil with adequate frequency to avoid dry soil conditions that may be prone to wind erosion on access roads, areas under construction, and the staging area. Avoid over watering so as not to create surface flow down construction and SEZ access roads.

AQ-2 Water all exposed stockpiled materials (soils, mulch) during construction to avoid dry material conditions that may be prone to wind erosion during storage. Cover exposed stockpiled materials between periods of active construction to prevent wind and water erosion.

Biological Resources

Special-status wildlife and botanical species (see Tables 3.4-2 and 3.4-3) have been identified either in or near the Project Area, and would be avoided to the extent feasible. The locations of all sensitive biological resources, and the methods to avoid them would be included in the construction drawings.

Vegetation

Disturbance to vegetation would occur because of the construction of the temporary access roads, channel construction and channel tie-ins. Design features include:

BIO-1 Temporary construction fencing will be placed at key locations where there are important riparian and wetland resources that potentially could be accidentally accessed by construction equipment operators.

BIO-2 Where disturbance cannot be avoided, prune or cut riparian vegetation at the ground to protect root structures and soil integrity. Pruning would be done with clean pruning equipment to ensure no introduction of disease or pests into the stems. Shoots, if viable, may be used for replanting.

BIO-3 During construction, any removed native riparian vegetation of good quality may be stockpiled and replanted once the new channel is constructed. Specifications for this work will be included in the construction drawings.

BIO-4 The vegetation will be irrigated and soil amendments added as needed while it is being stockpiled. Soil amendments and irrigation may also be used to help with plant establishment after replanting. A temporary drainage system would be constructed, as necessary, to capture excess water and keep it from discharging into the river. It is anticipated that most of the irrigation water would be taken up by the plants and infiltrate into the ground. Specifications for this work will be included in the construction drawings.

BIO-5 Disturbed areas, such as staging areas and access road footprints, will be revegetated or stabilized as needed once construction is complete. Specifications for this work will be included in the construction drawings.

BIO-6 The stockpile site will be regraded to the natural contours and revegetated at the completion of the project. Specifications for this work will be included in the construction drawings.

BIO-7 ~~20~~ If any sensitive plant species or special interest plant species are identified before or during project implementation, a buffer of up to 100 feet in diameter or distance determined by an LTBMU Botanist or Ecologist will be flagged around the sensitive resource. The specific area of the buffer will be determined on a site specific basis. An amendment to the Biological Evaluation (Appendix I) will be made to include and analyze any effects of the proposed project upon these botanical resources.

Wildlife and Fisheries

To avoid project-related disturbances to breeding activity and the habitat of the special status species (including species analyzed in the Biological Evaluation (BE) (Appendix H), California listed species , and TRPA species), limited operating periods (LOPs) would be implemented around nests, dens, roost sites, and other areas of concentrated use of these species. Design features that have been identified in the BE and construction controls ~~are included here~~ for the protection of wildlife would include:

BIO-7 On CTC lands, any management activities that require removal of trees and shrubs should be conducted outside the avian nesting season (April 1 through August 15) unless a qualified biologist determines that no nesting is occurring. A qualified biologist shall be retained to conduct a pre-construction survey for active nest sites of special-status avian species identified in the BE within a 1/8-mile radius prior to the onset of construction activities initiated during the nesting season (i.e. within 15 days). If surveys indicate that any bird nest occurs in the Project footprint, a no-disturbance buffer will be established around the nest site to avoid disturbance or destruction of the nest site, and USFWS and CDFG will be notified. These agencies may decide that a disturbance buffer should be maintained until after the breeding season or until a wildlife biologist determines that the young have fledged. Generally, the buffer zone would be 50 feet for nesting passerine birds and 500 feet for nesting raptors. However, the extent of these buffers for specific nests will be determined through coordination with CDFG and USFWS and will likely depend on the level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. These factors will be analyzed to make an appropriate decision on buffer distances. If an active bird nest is discovered after initial surveys have been completed and during construction activities, the nest should immediately be protected with an appropriate no-disturbance buffer and monitored by a qualified biologist to determine, in consultation with CDFG and the USFWS, if the buffer should be increased or decreased. This would, in part, depend on the listing status of the species, the location of construction activities, and the intensity of the construction activities at the time the nest was found.

In addition, on CTC lands, prior to project implementation, surveys for willow flycatchers and other avian species protected by the MBTA would be conducted to determine the locations of any active nest sites. Detection of active nests would be reported to the CDFG and LTBMU and nests would likewise be protected. Also, on CTC lands active nests of species protected by the MBTA would be protected in place with a 50 to 500 foot construction buffer as described in the preceding design feature.

On NFS lands, prior to project implementation, surveys for willow flycatchers would be conducted to determine the locations of any active nest sites. Any detection of willow flycatcher nests would be reported to the LTBMU Forest Wildlife Biologist. These willow flycatcher nests would be protected in accordance with the SNFPA (2004) which prohibits restoration activities within suitable habitat surrounding the active nest sites between June 1 and August 31.

BIO-8 If special-status wildlife species with agency-mandated protected activity centers and LOPs are found breeding in the Project Area, an LTBMU or TRPA wildlife biologist will implement appropriate LOPs around the protected activity center. On CTC lands nests of species covered by the MBTA would be protected in place until the young fledge via a 100-foot construction buffer.

BIO-9 Tree and snag removal within the wildlife movement corridor (forested land south of the airport) would be limited to trees within the footprint of the new channel or access routes or trees that are identified as a hazard to safe operations. Access routes would be positioned around existing trees and snags to avoid tree removal to the extent practical. Logs and brush piles would be left within the corridor area to provide wildlife cover for perches and nesting when it would not constitute a hazard to people or property.

BIO-10 Construction activities would be phased and managed so as not to present a continuous barrier to wildlife movement. Construction time would be minimized in the movement corridor (forested land south of airport) to complete constructing within a matter of days. Construction would only occur during summer daylight hours. Equipment and materials would not be stored in ~~or near~~ wildlife movement corridors and restoration-related human activity would be minimized within known movement corridors.

BIO-11 All trash created during construction will be properly contained (wildlife-proof containers) and removed at the end of each day. No food items would be left overnight on site due to the potential of attracting wildlife.

BIO-12 Retain or add downed wood in the open meadow areas where feasible for native amphibians and small mammal species. Density should be approximately three logs of >30 cm diameter at midpoint per 0.4 ha**.**

BIO-13 Salvage or retain large trees for wildlife habitat, future large wood recruitment, and to create snags in the future, unless removal is necessary for construction of the channel or access routes.

BIO-14 Salvage/recovery of fish will be conducted during dewatering of existing channel segments by electro-shocking or other suitable means as developed through consultation with the CDFG and LTBMU fisheries staff. Fish will be moved approximately 500 -700 feet upstream or downstream of project activities. Block nets will be installed to ensure fish do not move back into the segments to be dewatered. Block nets will be cleaned one to two times daily to ensure the nets are working correctly.

BIO-15 Western pearl shell Mussels (*Margaritifera falcata*) will be removed from the active river segment prior to diverting channel flow into the newly constructed channel. To the extent feasible, mussels will be relocated to similar habitat areas which have similar depth, substrate, and geomorphic setting (i.e. edge). The extent of pool, center of run, under overhanging bank at the site from which they are removed or to another location deemed suitable because of the presence of other mussels. The extent of the removal will be determined in the field by Forest Service aquatic biologist in consultation with CDFG biologists and will take into consideration the mussel population within and outside of the segments to be dewatered relative to the mussel population in other parts of the Upper Truckee River.

BIO-16 Construction activities would be scheduled to avoid upstream fish migration periods (after late June to mid-July depending on the water year).

BIO-17 During drafting activities, a screen will be placed over the drafting siphon to avoid impacts to juvenile fish.

BIO-18 Water drafting sites should be located in areas that will avoid adverse effects to stream flows and depletion of pool habitat. If instream flows or water drafting sites are not sufficient due to a lack of water, water would be obtained from local municipal water hydrants. Water drafting sites will be reviewed by a hydrologist or fisheries biologist every two weeks during low flow periods and determinations made regarding adequate minimum flows. If flows are not adequate for instream needs, drafting will be discontinued.

BIO-19 In order to minimize the impact on the willow community, clipping should take place in a random fashion, taking more from larger clumps and less from smaller clumps. Clipping in a single willow clump should not be great enough to alter the visual shape or the overall structure of the clump. No branches attached to a bird nest or within one meter of any part of a bird nest should be clipped.

~~**BIO-20** If any sensitive plant species or special interest plant species are identified before or during project implementation, a buffer of up to 100 feet in diameter or distance determined by an LTBMU Botanist or Ecologist will be flagged around the sensitive resource. The specific area of the buffer will be determined on a site specific basis. An amendment to the Biological Evaluation (Appendix I) will be made to include and analyze any effects of the proposed project upon these botanical resources.~~

Noxious and Invasive Weeds

Construction documents would include a Noxious Weed Risk Assessment (LTBMU) or other invasive weed management plan (CTC) which includes best management practices to ensure control of invasive species. Design features and construction controls to avoid impacts from noxious and invasive weeds include:

WEED-1 On NFS lands, LTBMU staff would survey the Project Area as needed during project construction and following completion and treat any additional noxious weeds that are found.

WEED-2 On CTC lands, a botanist designated by the CTC (CTC botanist, LTBMU botanist, or an<u>other</u> approved botanist) would survey the Proposed Project as needed during project construction and following completion and treat any additional noxious weeds that are found.

WEED-3 All off-road equipment used in the Project Area, and other vehicles that would travel on temporary access roads through the Project Area (i.e. not contained in the staging areas), shall be washed before moving into the Project Area to ensure that the equipment is free of soil, seeds, vegetative material, or other debris that could contain or hold seeds of noxious weeds.

"Off-road equipment" includes all tree removal and construction equipment and brushing equipment such as brush hogs, masticators, and chippers; it does not include log trucks, chip vans, service vehicles, water trucks, pickup trucks, and similar vehicles not intended for off-road use. Equipment would be considered clean when visual inspection does not reveal soil, seeds, plant material, or other such debris. When working in known weed infested areas equipment shall then be cleaned at a washing station before moving to other areas that do not contain noxious weeds.

WEED-4 All earth-moving equipment, gravel, fill, or other materials are required to be weed-free. Use onsite sand, gravel, rock, or organic material when possible. Otherwise, obtain weed-free materials from fill sources that have been surveyed and certified weed-free.

WEED-5 Minimize the amount of ground and vegetation disturbance in the construction areas. Reestablish vegetation where feasible on disturbed bare ground at the end of project implementation to minimize weed establishment and infestation, especially in staging areas.

WEED-6 Use weed-free mulches and seed sources. Salvage topsoil from the Project Area for use in onsite revegetation, unless contaminated with noxious weeds. All activities that require seeding or planting must utilize locally collected native seed sources when feasible. Plant and seed material should be collected from or near the Project Area, from within the same watershed, and at a similar elevation when feasible. Persistent non-natives such as *Phleum pratense* (cultivated timothy), *Dactylis glomerata* (orchard grass), or *Lolium* spp. (ryegrass) would not be used. Seed mixes must be approved by a Forest Service, TRPA or CTC botanist.

WEED-7 Weed infestations within the Project Area and along travel routes in and near the Project Area have been identified in storage, staging and construction areas. Before project implementation, these areas will be treated using chemical or hand methods, "flagged and avoided," or a physical barrier will be applied and maintained, depending on the risk presented by the species present. The Sunset Stables site will be used as a staging and stockpile area, and a 2 to 2.5 acre area will be covered with base rock or paving as needed to prevent disturbance of soil and contamination with cheat grass or other noxious weeds present during project implementation.

WEED-8 Weed infestations along access roads would be addressed by constructing an encapsulated road in these locations to avoid tracking seeds from infested sites into other portions of the project area.

Cultural Resources

The following measures would be implemented to avoid impacts to known and unknown archaeological resources in the Project Area.

CR-1 All eligible cultural resource sites and properties with undetermined eligibility within the APE will be avoided and protected in place.
~~All known cultural resource sites within the Project Area will either be avoided and protected in place or be beneficially impacted (e.g., backfill and stabilization of Site 58/FS-05-19-1206). Known sites near access or staging areas will be fenced off and the Contractor and/or LTBMU construction crew staff will be notified to prevent disturbance during construction activities.~~

CR-2 If unrecorded/new cultural resources (i.e., prehistoric sites, historic sites, and isolated artifacts and features) are discovered during project implementation, then work shall be halted immediately within 50 feet of the discovery, the CTC and/or LTBMU shall be notified, and a professional archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards and Guidelines ([Code of Federal Regulations, 36 CFR Part 61]) in archaeology and/or history shall be retained to determine the significance of the discovery.

CR-3 If potentially unique paleontological resources (fossils) are discovered during Project implementation, then standard BMPs shall be followed, including: work shall be halted immediately within 50 feet of the discovery, the CTC and/or LTBMU shall be notified, and a professional paleontologist shall be retained to determine the significance of the discovery.

CR-4 If human remains are discovered during the Proposed Project implementation, then work shall be halted immediately within 50 feet of the discovery, the CTC and/or LTBMU shall be notified, and the County Coroner must be notified, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), and the procedures outlined in the Native American Graves Protection and Repatriation Act and CEQA Section 15064.5(d) and (e) shall be followed.

Geology, Hydrology and Water Quality

A variety of BMPs would be employed to prevent adverse impacts to soil and water resources. The BMPs were determined following guidance as provided in the USFS Region 5 BMP Handbook, "Water Quality Management for Forest System Lands in California: Best Management Practices" (USDA 2000). The BMPs identified in the R5 Handbook provide general guidance for the water quality protection measures that must be considered in formulating a project. Detailed specification for these BMPs would be incorporated into the final design plans and SWPPP, currently under development. These documents would be included in the submittal for an NPDES permit by the Regional Board prior to project implementation. Detailed specifications would also be included in contracts or other controlling documents used to conduct and administer the project.

The applicable project BMPs from the R5 BMP Handbook are presented in Appendix F. The Geology, Hydrology and Water Quality (GHWQ) BMPs, design features, and construction controls described below provide additional details regarding the method and techniques for how these BMPs would be implemented during construction of this project. The applicable BMP for which this additional detail applies is referenced in parentheses below:

GHWQ-1 Erosion control measures may include but will not be limited to: silt fences, straw wattles, coir logs, water filled berms, mulching, gravel/sand bags, construction limit fencing, and revegetation (BMP 2-2 and 2-15).

GHWQ-2 Earthwork will be confined to areas of construction activities according to the construction sequencing plan that will be described in the contractor specifications or design details and permit documents (BMP 2-2). The construction sequencing for each reach would allow for winterization and close-out of certain construction areas as work in those areas is completed. Reach 5 and 6 excavation activities and channel tie-ins will not be conducted concurrently.

GHWQ-3 Earthwork within the river channel is proposed to take place in the drier months of July, August, and September. All project activities that involve the need for water diversions or new ground disturbance would be planned to be completed by October 15th~~st~~ each year, unless a grading variance exemption is obtained (BMP 2-3).

GHWQ-4 Temporary haul roads will be constructed for transport of fill and/or stockpiling material where they cross the SEZ wet meadow areas. These roads are anticipated to be constructed of geotextile fabric topped with sand, or an alternative with equal or lesser impacts. Haul roads will be temporary and will be removed prior to each winter season and will be restored when they are no longer needed to their preconstruction condition as feasible, including decompaction and revegetation (BMP 2-1, 2-7 and 2-26).

GHWQ-5 Up to three temporary crossings/bridges will be constructed to transport materials across the river to facilitate construction and avoid impacts to the channel. The crossings/bridges will be

designed to allow for fish passage and with temporary BMPs to reduce sediment discharges to the UTR. Crossing/bridge approaches will be stabilized with geotextile material and gravel or an alternative material.

- Temporary bridges or railcar bridges would be installed with BMPs (such as silt fences, coir logs, silt curtains, etc.) to isolate the road surface from the active channel. Bridge abutments would be located on floodplain surfaces outside of the active channel.

- Temporary constructed crossings would consist of culverts placed on the active channel bottom, geotextile fabric, and clean washed gravel. (BMP 2-16 and 2-17). Constructed crossings would also be installed with erosion control BMPs such as silt fences, coir logs, sand bags, etc.

GHWQ-6 Localized pumping will be used to clear the construction area of turbid standing water resulting from the excavation of saturated soils and intercepted groundwater. Pumped water would be used to irrigate planted vegetation or sod borrow areas, sprayed on the meadow surface or pumped to upland dewatering sites, held in Baker Tanks, or otherwise treated to remove suspended sediment to comply with the requirements of the permit prior to discharging to the river (BMP 2-15). Dewatering activities will be monitored closely to ensure that surface flow and meadow saturation is avoided.

GHWQ-7 Construction materials will be stored at designated stockpile areas that have experienced previous ground disturbance. Stockpile areas would be delineated with construction limit fencing. Stockpiled material and material transported by vehicle off site will be covered and/or kept visibly moist to control fugitive dust emissions and wind erosion (BMP 2-13). In addition, each stockpile would be covered during winter periods, and silt fencing or coir logs would be installed at the base of the piles to prevent transport of stockpiled material.

- ~~At the Sunset Stables staging and stockpile area, drainage BMPs would be installed such as gravel infiltration areas and providing groundcover during winter periods.~~ In addition, portions of ~~this~~ the Sunset Stables staging area may be paved (or otherwise covered) to prevent the spread of the invasive plant cheat grass. The paving/cover would be temporary, and would be removed after the site is no longer needed for Reach 5 and 6 implementation. If this site is paved or covered, drainage BMPs would be installed such as gravel infiltration areas during winter periods.

GHWQ-8 Construction vehicles will be serviced in specified upland areas or stabilized areas to prevent accidental spills of fluids, oils, and lubricants from reaching unprotected soils or surface water (BMP 2-12).

GHWQ-9 Construction equipment shall be cleaned to remove any loose dirt or sediment prior to exiting the site. Access roads will be watered regularly throughout active construction to prevent fugitive dust, and stockpile area entrances will be armored to prevent tracking of sediments onto ~~county roads~~ U.S. Highway (BMP 2-23).

GHWQ-10 Unexcavated earthen barriers in the form of a buffer between new channel construction and the existing channel will be left in place wherever the new channel intersects the original channel. In addition, water filled berms or an alternative may also be installed so the new channel can properly “season” (i.e. allow consolidation of constructed features and establishment of vegetation) prior to reintroduction of flow (BMP 2-14).

GHWQ-11 The Proposed Project site will be stabilized at the end of each construction season. BMPs used for stabilization will include coir logs adjacent to access roads and providing ground cover over bare soil areas. Winterization of the new channel construction areas will include installing

water filled berms and/or coir logs to isolate the active channel from the newly constructed channel segments so that sediment delivery is avoided in the event of an overbank flood event. ~~All disturbed areas will be stabilized and revegetated after construction is complete (BMP 2-2).~~

GHWQ-12 All disturbed areas, including staging and storage sites, will be stabilized and revegetated following construction (BMP 2-2).

GHWQ-13 To reduce erosion and failure of stream banks, portions of the new channel banks would be stabilized where necessary using measures such as placement of rocks at the toe of banks, grading to create more stable bank slopes, and placement of wood jams to direct flows away from banks. Riparian vegetation would also be planted to stabilize the banks. Irrigation and revegetation efforts would continue until revegetation success is determined adequate to prevent water quality degradation and sediment delivery by implementing and regulatory agencies. "Seasoning" of the bank treatment may take up to three years, depending on annual growing conditions and revegetation success. The first flushes of the new channel would be monitored to look for any erosion or bank failure issues. These areas would be stabilized, as appropriate.

GHWQ-14 New channel segments will be flushed with water several times before being connected to the river flows. This will allow for loose sediments to be flushed downstream, and collected and pumped to designated dewatering sites, or to be embedded into the new channel substrate in order to minimize the amount of sediment released during channel tie-ins in the final year of implementation for each reach.

Hazards and Hazardous Material

Construction of the Proposed Project would involve the short-term use of hazardous materials, principally diesel fuel, hydraulic fluid and other materials necessary for operation and maintenance of construction equipment. There are no known hazardous materials to have ever been previously treated, stored, disposed, spilled or leaked onto the construction site (EDR 2008, SWRCB 2010a, DTSC 2010, and CalEPA 2010). The Proposed Project would excavate near, and modify, the STPUD ~~sewer~~ utility lines. Although untreated sewage is not a "hazardous material" pursuant to the EPA's Domestic Sewage Exclusion (40 CFR 261.4[a][1]), any accidental sewage release would be a water quality concern.

The Proposed Project incorporates several design features and construction control measures to reduce impacts and risk from hazards and hazardous materials. Work performed for the Proposed Project is required to conform to all federal and state requirements for the protection of worker health and safety and environmental protection during management of construction activities. The following design features, BMPs and construction control measures would be implemented; BMP 7-4 in Appendix F applies to all:

HAZ-1 Hazardous materials required for project implementation, listed above, will be stored at the main staging areas at the former Sunset Stables site, and other suitable sites.

HAZ-2 Work will stop immediately if suspected contamination is encountered, and the Project Engineer shall be notified immediately. Upon confirmation of contamination, the Project Engineer will assess the Project design and obtain the required approvals to modify the design to avoid conflicts with the contaminated material and/or any ongoing or future remediation projects.

HAZ-3 All encountered contamination will be addressed and handled appropriately, as described in the SWPPP. The Land owner will provide records regarding any contamination encountered during the Proposed Project to any appropriate requesting party. Appropriate requesting parties include, but are not limited to, the Lahontan Regional Water Quality Control Board, El Dorado

County Department of Environmental Management, any responsible party or potentially responsible party, or the designated environmental consultant to any responsible party or potentially responsible party.

HAZ-4 All soil and groundwater materials removed during construction activities that have been deemed hazardous shall be placed in labeled containers and disposed of appropriately. Excavated soils that have been deemed hazardous will not be used as backfill material. Depending on the type of hazardous material, a water truck or other approved water spraying device will be on site at all times during excavation of hazardous or potentially hazardous materials, or materials would be covered to prevent particles from becoming airborne.

HAZ-5 On NFS lands, spill prevention and clean-up of hazardous materials would be implemented in accordance with the LTBMU Spill Notification and Response Plan (for emergency spills) or with USFS BMPs for non-emergency spills (USDA 2000). On CTC lands, all c~~C~~ontractors are responsible for familiarizing their personnel with the information contained in the SWPPP. Contractors will train/instruct onsite construction personnel in spill prevention practices and provide spill containment materials near all staging areas. Further information regarding spills will be available in the Spill Response section of the SWPPP.

HAZ-6 A construction safety plan will be developed and implemented that will include safety measures for activities in Runway Safety Zones and Obstruction Free Areas to include schedule, procedures to ensure Airport Safety, and responsible personnel.

HAZ-7 All construction equipment that normally does not contain a spark arrester will be fitted with an arrester in good working order to minimize construction-related wildfire ignition. Equipment to be fitted with spark arresters will include, but not be limited to, heavy equipment and chainsaws.

HAZ-8 The contractor or USFS shall clear dry vegetation and other potential fire fuels, to the extent feasible, in and near work areas. ~~Vehicles shall not travel over or park on vegetated areas.~~ Ignition sources unrelated to project implementation (e.g. smoking [unless in designated areas], barbecues, stoves, campfires) shall be prohibited.

Noise

The following noise-reducing construction practices would be employed to reduce impacts to sensitive users during daytime hours.

NOI-1 Construction activities that involve the use of heavy equipment or motorized tools (e.g. chainsaws) would be limited to the hours from 7:00 am – 6:30 pm.

NOI-2 Prior to construction, all residences within 300 feet of construction areas would be notified in writing of the proposed construction activities. Construction scheduling and contact information would be clearly displayed on construction fencing.

NOI-3 If complaints are received regarding noise impacts to any nearby sensitive receptors (i.e. residents less than 500 feet from activities) the CTC or LTBMU shall prepare a plan demonstrating appropriate noise-reducing measures. The plan shall be submitted to TRPA for review and approval, and shall be implemented during all construction activities occurring outside of TRPA's exempted hours.

Public Safety and Recreation

The construction sites would be closed to the public during construction activity, from approximately June through October 15 each year of active construction. All trails in the Project Area are user-created, and are not part of any trail system. Access to some user-created trail segments would be lost once the new channel alignment is constructed and re-activated. Design features to reduce impacts to recreation and public safety include:

REC-1 Postings and public notices would be issued in advance of construction and posted at public access points and trails including the main north-south trail and the Elks Club parking area (trailhead and boating access to the river) to inform the public of the construction activities and restricted areas.

REC-2 Construction fencing would be placed around the construction and staging area perimeters to deter users from continued use of trails leading into the construction area during implementation.

REC-3 Where possible, access to trail users during construction would be provided around/outside the construction site.

REC-4 Restore unrestricted river access (boating put-in access from the Elks Club parking area and boating passage within the river channel) once construction and restoration has been completed.

Traffic and Circulation

TR-1 When using the Sunset Stables area for staging and storage, the contractor or USFS shall provide traffic control as needed on the specific days of transport of heavy equipment to prevent congestion and safety hazards at the intersection of ~~Highway~~ U.S. 50 and the Sunset Stables Access Road.

TR-2 During construction, temporary parking would be provided for construction workers or USFS employees at the former Sunset Stables property and/or at the former Elks Club property, and possibly at the northeast end of the Project Area. If parking is provided at the northeast end of the Project Area, a stabilized area would be used for temporary parking and this area would be removed and restored to preconstruction conditions.

TR-3 Airport staff would be notified of the timing of operations. ~~so they can prepare a Notice to Airmen (NOTAM) that would be circulated should construction equipment be present near the airport operations area.~~

Utilities

UTIL-1 Prior to commencement of excavation activities, the contractor or USFS shall be required to notify USA Alert to establish the location of all known utility facilities and be in close coordination with the STPUD. For excavation within the area of known underground utility lines, the contractor or USFS shall work directly with the STPUD to avoid disturbance to buried utility lines and prevent possible discharges associated with any breaks in lines.

UTIL-2 The Contractor or USFS will coordinate closely with the STPUD and, in advance of implementing construction, develop an emergency response plan in the event that there are any accidental water or sewer line utility breaks. This emergency response plan would include isolating and containing any discharges.

Greenhouse Gases

BMPs and control measures for air quality impacts would also reduce greenhouse gas (GHG) emissions. Additionally, the following measures are considered best management practices for further reducing GHG emissions from construction projects.

GHG-1 Improve fuel efficiency of construction equipment. Maintain all construction equipment in proper working condition according to manufacturer's specifications. Use the proper size of equipment for the job. Use equipment with new technologies, where available/feasible (repowered engines, electric drive trains).

GHG-2 Idling time shall be minimized to five minutes when conditions allow for diesel-powered equipment.

GHG-3 CARB-approved diesel fuel shall be used for diesel-powered equipment.

GHG-4 Any onsite vegetation shall be preserved or replaced (if removal is necessary for Project activities) as a means of providing carbon sequestration.

2.4.4 Monitoring and Adaptive Management

The Monitoring Plan is provided in Appendix J. The Plan describes the monitoring that would be required for the Upper Truckee River Sunset Stables Restoration Project. The purpose of project monitoring is to track the implementation of the construction controls and design features found in Section 2.4.3.11 and the prescribed BMPs (Appendix F), and in some cases, to measure their short-term effectiveness at protecting resources. The monitoring includes:

Implementation monitoring consists of inspections of project treatment areas, temporary roads, stream crossings, staging areas, etc. to ensure that all management practices and design features are implemented as prescribed, including those designed to prevent sediment delivery and protect water quality (e.g., erosion control measures, drainage BMPs, etc.).

Effectiveness monitoring consists of inspections of the project area to evaluate the effectiveness of the prescribed design features/construction controls and management practices at meeting their objectives. It includes evaluating the effectiveness of management practices designed to prevent sediment delivery and protect water quality (e.g., erosion control measures, drainage BMPs, etc.).

Required Monitoring

For the Reach 5 components of the Upper Truckee River Sunset Stables Restoration Project the Best Management Practice Evaluation Program (BMPEP) protocols developed by the USFS and the CA State Water Resources Control Board (USDA FS, 2002) will be followed to provide qualitative information about BMP implementation and effectiveness. The Region 5 BMPEP On-Site Evaluation form will be used to rate the effectiveness of the BMPs.

In addition to the BMPEP program, the project monitoring elements listed below will occur for all components of the Sunset Stables Project.

- Design implementation inspection and reporting
- SWPPP Monitoring
- Vegetation monitoring

- Invasive Weeds monitoring
- Heritage resource monitoring
- Adaptive Management

Adaptive Management

A multi-agency Adaptive Management process has been established for UTR restoration projects. In line with this process, adaptive management will be conducted by the project proponents for the multiple UTR restoration projects. This will involve coordinated inspections of project areas after high flow events and spring runoff periods to identify any areas of erosion or other resource concerns. Inspections will continue annually for approximately 5 years after project completion in each restoration reach. A plan for how to address these problem areas will be determined under consultation with agency stakeholders and regulatory agencies to ensure that the problem will not become a chronic or recurring water quality impact.

2.4.5 Comparison of Alternatives

This section provides a summary of the effects of implementing the No Project Alternative and the Proposed Project Alternative. Information in Table 2-2 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2-2 Summary of Effects of Alternatives

Resource	No Project	Proposed Project
Aesthetics	The No Action/No Project Alternative would not result in visual impacts on the Project Area as no construction would occur. The Visual Quality Objective (VQO) of retention would continue to be met with no action.	The Proposed Project would have temporary construction-related impacts. During construction, construction equipment and vehicles could be visible from ~~Highway~~ U.S. 50, the Airport, and in the meadow area. Some areas around the new channel would be visibly altered by tree removal until vegetation is re-established (3 to 5 years). Over the long-term (greater than 5 years), the Proposed Project would restore the floodplain and river channel resulting in enhanced riparian and meadow area, thus improving the visual character of the area. The VQO of Retention would be met with the proposed project.
Air Quality and Climate Change	The No Action/No Project Alternative would not result in any air quality impacts as construction would not occur.	The Proposed Project would temporarily generate some air emissions during construction, but would not exceed thresholds established by federal, state and local agencies.
Biological Resources	The No Action/No Project Alternative would have no direct negative impacts on special-status plant or animal species. However, indirect effects to biological resources in the Project Area would include degraded meadow floodplain and instream habitat conditions.	The Proposed Project would have temporary (4 to 10 years) but less than significant impacts on biological resources (see Tables 3.4-2 and 3.4-4) from construction effects. The restored stream channel and associated riparian vegetation would provide an overall benefit for some aquatic and wildlife resources.
Cultural and Heritage Resources	The No Action/No Project Alternative would result in no physical changes to the Project Area. Erosion would continue to affect Site 58/FS-05-19-1206 over the long-term; however these impacts would not be significant.	The Proposed Project would have no significant impacts on cultural resources with incorporation of design features (Design Features CR-1 – CR-4) to avoid known resources and to monitor construction in order to protect unknown resources.
Geology and Soils	Because no construction activities would occur, the No Action/No Project Alternative would not result in direct, indirect or cumulative effects to geology or soil resources.	The Proposed Project would restore the river to a more natural state (geomorphically stable channel), which would reduce erosion and increase the potential for overbank flow. The new channel banks would be stabilized using vegetation, rocks, and other natural materials. Excavated soils would remain on the site and would be used to backfill the existing channel. Construction activities would have the potential for soil loss and erosion; however, erosion control measures (Design Features GHWQ-1 – GHWQ-14) would be implemented to reduce or eliminate this impact to less than significant.

Greenhouse Gases	The No Action/No Project Alternative would not involve construction and would not emit any GHGs and therefore would have no impact on GHG emissions.	The Proposed Project would temporarily increase GHG emissions for a 4 month period over 4-10 years during construction. Furthermore, new plantings along the river banks and improved health of the floodplain meadow would help offset these emissions through carbon sequestration over the life of the new vegetation.
Hazards and Hazardous Materials	There are currently no known hazards or hazardous materials in the Project Area. The No Action/No Project Alternative would not change existing conditions with regard to hazards and hazardous materials.	The Proposed Project would incorporate design features (Design Features HAZ-1 – HAZ-8) and construction controls that would reduce any impacts from construction-related hazards and hazardous materials (e.g., sewage from buried utility pipelines, petroleum products used by construction equipment) to less than significant.
Hydrology and Water Quality	Under the No Action/No Project Alternative, water quality and frequency of floodplain inundation would both continue to decline. Channel erosion would continue and would likely include further incision and decreasing bank stability (current channel is approximately 6 feet deep and 36 to 69 feet wide). Changes in bank morphology in conjunction with scour and undercutting would likely result in bank failure and corresponding impacts on water quality from sediment. Groundwater levels would continue to drop in response to the lower water surface elevation.	The Proposed Project has been specifically designed (both through channel design and project design features (GHWQ-1 – GHWQ-14) to minimize construction phase risks of water quality degradation from release of sediment or other pollutants. The new channel would result in reduced channel erosion, increased bank stability (proposed channel is approximately 3.9 feet deep and approximately 39 feet wide) and increased floodplain inundation and groundwater table elevation as compared to the No Action/No Project Alternative.

Table 2-2 Summary of Effects of Alternatives (continued).

Resource	No Project	Proposed Project
Noise	The No Action/No Project Alternative would have no noise or vibration impacts.	The Proposed Project would have less-than-significant, short-term construction noise (during active construction, June-October, for 4-10 years) and vibration impacts and no long-term noise impacts after construction.
Recreation	The No Action / No Project Alternative would not affect recreation (trail and river use) because no physical changes would occur in the Project Area.	The Proposed Project would temporarily restrict access to and along the river during construction (during active construction, June-October, for 4-10 years) for public safety reasons Construction would seasonally close or displace some trails. Design features (REC-1 – REC-4) would reduce recreational impacts to less than significant.
Transportation and Traffic	The No Action/No Project Alternative would have no effect on traffic or transportation as no construction would occur.	The Proposed Project would have less-than-significant effects on traffic and transportation as excavated material would be managed onsite and imported fill would result in at most 8-9 round trips per day during two of the four years construction will be occurring during the construction season.
Utilities and Service Systems	The No Project/No Action Alternative would not create additional demand for new or expanded utilities or service systems and would have no impact on existing sewer or water facilities.	The Proposed Project would result in less-than-significant impacts on utilities and service systems. There would be disruption to some services during lowering of the ~~sewer~~ backup treated effluent and water lines (intermittently for 1-2 weeks). The new channel construction would not require additional facilities or exceed the capacity of existing systems.