

2 PROJECT DESCRIPTION

This chapter describes the approach to selection of a Preferred Alternative, including a summary of the alternatives development process. A refined project description for the Preferred Alternative is also presented. The Preferred Alternative was selected based on screening each alternative's ratings related to meeting the goals and objectives of the project, purpose and need, project feasibility, and comments from the public and agencies on the draft environmental impact report/environmental impact statement/environmental impact statement (Draft EIR/EIS/EIS).

2.1 SELECTING A PREFERRED ALTERNATIVE

2.1.1 CEQA, NEPA, AND TRPA REQUIREMENTS

Alternatives evaluated in the Draft EIR/EIS/EIS were based on a combination of requirements from California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and Tahoe Regional Planning Agency (TRPA) provisions. In accordance with Section 15126.6 of the CEQA Guidelines, the Draft EIR/EIS/EIS included an analysis of alternatives that could feasibly attain most of the basic project objectives, a review of a no-project alternative, and a discussion of alternatives considered but determined to be infeasible. Section 15126.6 states that the alternatives analysis must:

- ▶ describe a range of reasonable alternatives for the project that could feasibly attain most of the basic objectives of the project but would substantially lessen or avoid any of the significant effects of the project;
- ▶ focus on alternatives capable of avoiding or substantially lessening any of the significant environmental impacts of the project, even if they may be more costly or could otherwise impede some of the project's objectives; and
- ▶ evaluate the comparative merits of the alternatives.

NEPA requires comparable treatment of the alternatives so that their comparative merits may be evaluated (40 Code of Federal Regulations [CFR] 1502.14[b]).

The NEPA regulations (40 CFR 15012.14) require that an environmental analysis include:

- ▶ an objective evaluation of reasonable alternatives;
- ▶ identification of the alternatives considered but eliminated from detailed study, along with a brief discussion of the reasons why these alternatives were eliminated;
- ▶ information that would allow reviewers to evaluate the comparative merits of the proposed action and alternatives;
- ▶ consideration of the no-action alternative;
- ▶ identification of the agency's preferred alternative, if any; and
- ▶ identification of appropriate mitigation measures not already included in the proposed action or alternatives.

Unlike CEQA, which permits the evaluation of alternatives to occur in less detail than is provided for a proposed project, NEPA requires the analysis of all alternatives considered in the analysis to occur at a comparable level of

detail. NEPA regulations (40 CFR 1502.14) require agencies to rigorously explore and objectively evaluate all reasonable alternatives and to devote substantial treatment to each alternative considered.

Section 3.7 of the TRPA Code of Ordinances describes EIS requirements, and specifically the need to study, develop, and describe appropriate alternatives to address unresolved conflicts in uses of available resources. Similar to NEPA, TRPA typically evaluates alternatives analyzed at a comparable level of detail; however, this is not a requirement.

The Draft EIR/EIS/EIS provided comparable detail in the analysis of a reasonable range of alternatives, including a no-action alternative. These alternatives were identified after other alternatives were considered but eliminated from detailed study in the manner directed by NEPA and TRPA. After input from responsible and interested agencies and public comments provided on the Draft EIR/EIS/EIS the Conservancy implemented a two-step process for recommending alternative components to be brought forward into the Preferred Alternative. Step one involved developing criteria and a process for selecting a Preferred Alternative, while step two implemented the process to establish the Preferred Alternative.

ALTERNATIVES DEVELOPMENT PROCESS FOR THE DRAFT EIR/EIS/EIS

The primary purpose of the project is to restore natural geomorphic processes and ecological functions to improve the area's ecological values and help reduce the river's discharge of nutrients and sediment that diminish Lake Tahoe's clarity, while still providing safe access to vistas and environmental education to the public.

The project purpose and need and project goals and objectives, as described in Chapter 1, "Introduction and Statement of Purpose and Need," were used to develop the alternatives evaluated in the Draft EIR/EIS/EIS. None of the alternatives evaluated in the Draft EIR/EIS/EIS were designated as preferred. Rather, guiding principles were developed requiring that each alternative be designed as a "full-spectrum" alternative that addressed, to varying degrees, all project objectives and design directives; be modular in nature, such that recreation access and infrastructure components could be interchangeable with habitat restoration and protection measures proposed; and embody a diverse range of feasible and implementable concepts, consistent with constraints identified and mapped early in the planning process (Conservancy and DGS 2003).

Each of the alternatives also needed to be developed within the context of existing land use regulations and stated California Tahoe Conservancy (Conservancy) purposes for acquiring properties. Long-term maintenance costs were also considered in the development process.

Four preliminary conceptual alternatives and a "No Project/No Action" alternative were developed and refined by the Conservancy, the U.S. Bureau of Reclamation, TRPA, and a team of technical consultants after review of scoping comments received on the Notice of Preparation and Notice of Intent, as well as comments provided at public information meetings conducted to obtain additional public input. Alternatives passing the screening review were carried forward into the Draft EIR/EIS/EIS for detailed evaluation of potential environmental impacts. The overall plan of each alternative evaluated in the Draft EIR/EIS/EIS was conceptual for analysis purposes, and final design of the Preferred Alternative may reflect modifications to project features made as a result of the normal design refinement process or to satisfy permitting agencies or other parties involved in the final decision-making process. These modifications may not substantially increase the intensity or severity of an impact or create a new significant impact without further environmental review.

The full range of reasonable alternatives presented for public review during circulation of the Draft EIR/EIS/EIS were as follows:

- ▶ **Alternative 1**—Channel Aggradation and Narrowing (Maximum Recreation Infrastructure)
- ▶ **Alternative 2**—New Channel—West Meadow (Minimum Recreation Infrastructure)
- ▶ **Alternative 3**—Middle Marsh Corridor (Moderate Recreation Infrastructure)
- ▶ **Alternative 4**—Inset Floodplain (Moderate Recreation Infrastructure)
- ▶ **Alternative 5**—No Project/No Action

During refinement, several facilities were removed from the alternatives, in particular a full-service visitor center and restrooms. This preliminary assessment is presented in Section 2.2.2, “Alternatives Considered but Eliminated from Detailed Evaluation,” of the Draft EIR/EIS/EIS. Alternative locations were also considered; however, they would not fulfill the purpose and primary objectives of the project. Off-site actions upstream along the Upper Truckee River or elsewhere in the watershed could reduce the river’s discharge of nutrients and sediment, but would not substantially improve ecological values of the study area.

The Draft EIR/EIS/EIS presented overview maps and describes in detail the river restoration, terrestrial habitat restoration and enhancement, and public access and recreation features of each alternative. Additional information regarding the alternatives is provided in the Draft EIR/EIS/EIS appendices: Appendix C, “Schematic Plans,” provides additional detail about the elements of each project alternative; Appendix D, “Construction Workers and Equipment for Action Alternatives,” lists the construction workers and equipment associated with specific construction activities; and Appendix E, “Alternative Cost Estimates,” provides cost estimates of the elements and the total cost of Alternatives 1–4 (which were prepared in 2006 for the *Upper Truckee River and Wetland Restoration Project Final Concept Plan Report* [Concept Plan Report]).

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

To restore the river channel and its connection to the floodplain, Alternative 1 would increase channel length and decrease channel capacity. A key element of this restoration would be the use of engineering elements (primarily structures in the channel) to cause sediment deposition that would raise the channel bed and decrease channel capacity and would slightly reduce the capacity of the channel mouth at Lake Tahoe.

Alternative 1 also would restore a naturally functioning lagoon in the vicinity of the existing Sailing Lagoon, lagoon and wet-meadow conditions behind the east end of Barton Beach, floodplain functions at the Tahoe Keys Property Owners Association (TKPOA) Corporation Yard (contingent on TKPOA consent), and sand ridges (“dunes”) at Cove East Beach. Alternative 1 would enhance forest habitat and an area of “core habitat” in the center of the study area that contains sensitive marsh by removing or relocating volunteer (i.e., user-created) trails. In addition, at the existing location where boaters enter and exit the Upper Truckee River, adjacent to East Venice Drive, the river bank would be stabilized with best management practices (BMPs) to avoid erosion and other resource damage.

Alternative 1 would provide a potential “maximum” level of recreation infrastructure that would include parking on the west side of the study area adjacent to the Tahoe Keys Marina, a connected system of bicycle paths, boardwalks, observation areas, two kiosks, and signage. Bicycle paths would be Class I/Shared-Use Paths (as described in TRPA and TMPO 2010). Bridges over Trout Creek and the Upper Truckee River (and a boardwalk) would connect the proposed bicycle paths. Bicycle paths would connect to existing regional trails near the study area.

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

To restore the river channel and its connection to the floodplain, Alternative 2 would directly raise the streambed elevation, increase the channel length, and decrease channel capacity. A key element of this restoration would be the excavation of a new river channel that would have less capacity than the existing channel. The existing river mouth would be replaced with a new smaller river mouth, similar in size to the historical river mouth before dredging.

The river channel and floodplain restoration elements of Alternative 2 would require modification and/or relocation of two existing stormwater discharge locations. Alternative 2 also includes all of the other restoration and enhancement elements of Alternative 1. In addition, at the existing location where boaters enter and exit the Upper Truckee River, adjacent to East Venice Drive, the river bank would be stabilized with BMPs to avoid erosion and other resource damage. To protect natural resources, a boardwalk connecting the river to East Venice Drive would be constructed.

Alternative 2 would provide a “minimum” level of recreation infrastructure that would include a modified Americans with Disabilities Act (ADA)–accessible pedestrian trail to Cove East Beach, five viewpoints, a fishing platform, and signage. Except for four viewpoints along the eastern perimeter of the study area (adjacent to the Al Tahoe neighborhood), this infrastructure is located from East Venice Drive to Cove East Beach.

Alternative 3: Middle Marsh Corridor (Moderate Recreation Infrastructure)

To restore the river channel and its connection to the floodplain, Alternative 3 would promote the development through natural processes of a new main channel and/or distributary channels in the central portion of the study area. A “pilot” channel, similar to the channel segments constructed under Alternatives 1 and 2, would be constructed from the existing river channel to historical channels in the center of the study area, but a channel would not be constructed in the central or northern portions of the study area. Rather, natural processes would be allowed to dictate the flow path(s), bed and bank elevations, and capacities of the channel(s) through the Marsh. The existing river mouth would be retained, but its capacity would be reduced and minimum elevation controlled. In addition, by boring two culverts under U.S. Highway 50 (U.S. 50), an area of isolated floodplain would be reactivated. Alternative 3 has no stabilizations or infrastructure proposed in the vicinity of East Venice Drive. Bank stabilization is not proposed at East Venice Drive because the concept of Alternative 3 does not dictate the location of the channel(s), and it is therefore unclear where the primary channel will be located and whether and to what extent it will require stabilization. Alternative 3 would allow natural processes to determine flow paths through the Marsh. The river channel and floodplain restoration elements of Alternative 3 would require modification and/or relocation of two existing stormwater discharge locations. Also, like Alternatives 1 and 2, Alternative 3 would restore a naturally functioning lagoon in the vicinity of the Sailing Lagoon and floodplain functions at the TKPOA Corporation Yard, and would enhance areas of “core habitat” and forest. However, Alternative 3 would not restore lagoon and wet-meadow conditions behind the east end of Barton Beach (by removal of existing fill) or dunes at Cove East Beach.

Alternative 3 would provide a “moderate” level of recreation infrastructure that would include three pedestrian trails, a bicycle path, a kiosk, one observation area, six viewpoints, a fishing platform, and signage at multiple locations. As under Alternative 2, the modified pedestrian trail to Cove East Beach would be ADA-accessible, as would the fishing platform at the restored lagoon. Alternative 3 also would include a bicycle path and a pedestrian trail near the Highland Woods neighborhood, connected to Mackinaw Road, as well as a pedestrian trail adjacent to the Al Tahoe neighborhood from Capistrano Avenue to East Barton Beach, two segments of which would be boardwalks.

Alternative 4. Inset Floodplain (Moderate Recreation Infrastructure)

To restore the river channel and its connection to the floodplain, Alternative 4 would lower bank heights. This alternative would involve excavation of an inset floodplain along much of the river channel and localized cutting and filling to create meanders in the existing straightened reach. The existing river mouth would be retained and its capacity would not be reduced. Although Alternative 4 would include the enhancement of core and forest habitats, it would not include the restoration of floodplain functions at the TKPOA Corporation Yard, a naturally functioning lagoon in the vicinity of the existing Sailing Lagoon, or dunes at Cove East Beach. In addition, at the existing location where boaters enter and exit the Upper Truckee River, adjacent to East Venice Drive, the river bank would be stabilized with BMPs to avoid erosion and other resource damage.

Like Alternative 3, Alternative 4 would provide a “moderate” level of recreation infrastructure that would include two pedestrian trails, a bicycle path, a kiosk, two observation areas, five viewpoints, and signage at multiple locations. The bicycle path would be adjacent to the Highland Woods neighborhood and connected to Mackinaw Road. The pedestrian trails would be near the Tahoe Keys from East Venice Drive to Cove East Beach, in part replacing the existing pedestrian trail, and adjacent to the Al Tahoe neighborhood from Capistrano Avenue to San Francisco Avenue, one segment of which would be a boardwalk.

Alternative 5. No Project/No Action

Alternative 5 would not provide any actions to restore the river channel and its connection to the floodplain in the study area. This alternative would allow but not facilitate the long-term, passive recovery of the river system via natural processes. The existing river mouth location, size, and bed elevation would continue to adjust to lake levels, streamflows, and sediment loads. The Upper Truckee River–lagoon connection would not be restored, leaving the direct open-water connection between the Tahoe Keys Marina channel, the Sailing Lagoon, and Lake Tahoe unchanged. The previously leveled area between Cove East Beach and the Sailing Lagoon would not be modified. Alternative 5 would not protect an extensive area of core habitat. However, the Conservancy has been implementing localized decommissioning of some trails, and similar actions would likely continue to be implemented.

Alternative 5 would not include any direct steps to construct recreation infrastructure elements that would alter public access. However, this alternative would likely involve maintaining existing infrastructure and might result in the construction of some additional, smaller elements (e.g., signage).

PREFERRED ALTERNATIVE DEVELOPMENT PROCESS

The Conservancy implemented a two-step process for recommending alternative elements to be brought forward into the Preferred Alternative. Step one involved developing criteria and a process for selecting a Preferred Alternative, while step two implemented the process to establish the Preferred Alternative. Each step was peer reviewed by a Science Review Panel and Technical Advisory Group. The Science Review Panel's members possess expertise in a range of disciplines germane to the project. The Technical Advisory Group comprises representatives of partner agencies, funding entities, and regulators that have specific Tahoe Basin experience and responsibilities.

The following three criteria were used to select the Preferred Alternative:

- ▶ **C1: Benefits**—this criterion addresses the overall performance of the restoration and recreational elements relative to the project objectives and purpose and need. The evaluation relies on the Concept Plan Report (Conservancy and DGS 2006) and the Recreation Opportunity Spectrum. The Concept Plan Report includes an analysis of the four action alternatives and the no-action alternative based on their ability to fulfill the project objectives. The Conservancy based its restoration element rating on the findings of the Concept Plan Report, and on the ability of the restoration element to replicate geomorphically appropriate conditions and functions. The Conservancy uses the Recreation Opportunity Spectrum to characterize recreation opportunities in terms of a location's setting, activities, and resulting experience. Distinguishing these opportunities helps recreation managers to create and maintain appropriate recreation experiences.
- ▶ **C2: Responsiveness to Public Comments**—this criterion analyzes public preferences and concerns received during the Draft EIR/EIS/EIS public review period regarding specific alternative elements.
- ▶ **C3: Overall Feasibility**—this criterion consists of four subcriteria: potential impacts, permits/agreements/acquisitions, funding, and sustainability. The Draft EIR/EIS/EIS analyzed the impacts of the alternatives and, along with the Concept Plan Report, provided the foundation for several subcriteria under C3.

The permits/agreements/acquisitions subcriterion considers the two primary acquisitions associated with the study area. The Conservancy acquired the western portion from the Tahoe Keys Subdivision developer via a litigation settlement agreement in 1988, which stipulates that public access be maintained to the beach along Lake Tahoe, consistent with natural resource values. The Conservancy Board approved the Barton Meadow acquisition (the eastern portion of the study area) in 2000 for the protection of habitat and water quality, and to restore the property's natural resource values.

The Conservancy rated the alternatives under the funding subcriterion based on their cost/benefit and phasing potential. Because the alternatives do not differ from a phasing perspective, the cost/benefit was the driving consideration for the rating under this subcriterion.

The Conservancy used a qualitative system to weigh the pros and cons of the alternatives to develop a Preferred Alternative. Numeric ratings were not applied because consistent data are not available to quantify benefits and feasibility. The five alternatives were rated using the rating scale shown in Table 2-1.

Rating	Color Code	Description
Preferred	P	Several or very essential pros; few or no cons.
Acceptable	A	Some substantial pros; may have some or minor cons.
Neutral	N	No obvious cons or pros, or they balance each other out.
Undesirable	U	Few to several cons; may have some substantial pros.
Objectionable	O	Very serious or unacceptable cons; few or very limited pros.

Source: Conservancy 2014

Consistent with the analysis approach presented in the Draft EIR/EIS/EIS, the restoration and recreation elements were evaluated independently. Furthermore, the recreation elements were separated geographically because of the unique physical characteristics and legal constraints that differentiate the east and west sides of the study area (Exhibit 2-1). The west side of the study area is defined as the area west of the centerline of the Upper Truckee River, located between the end of East Venice Drive and Lake Tahoe and adjacent to the Lower West Side Project. The east side of the study area includes the area east of the centerline of the Upper Truckee River near Lake Tahoe, areas adjacent to the Al Tahoe and Highland Woods subdivisions, and areas adjacent to the TKPOA Corporation Yard. The results of the evaluation of each element ranked are summarized below in Table 2-2.

PREFERRED ALTERNATIVE: MIDDLE MARSH CORRIDOR (EXISTING EASTSIDE RECREATION INFRASTRUCTURE AND MODERATE WESTSIDE RECREATION)

The Preferred Alternative includes the most beneficial and cost-effective elements of the five alternatives evaluated in the Draft EIR/EIS/EIS and Concept Plan Report. This alternative is also the most feasible, the most highly responsive to public comments, and the most resilient to the potential impacts of climate change. It includes the following components:

- ▶ *Alternative 3 for the Restoration Element:* Alternative 3 would involve construction of a small pilot channel that would reconnect the Upper Truckee River to the middle of the Marsh to attain ecosystem and water quality improvements. This concept proposes the most geomorphically appropriate channel configuration allowing the pilot channel to strategically connect the current river alignment to historic channels and lagoons. The river would form its own pattern and spread over the expanse of the Marsh, resulting in substantial benefits to habitats, wildlife, and water quality. The abandoned sections of existing river channel would be largely filled to create restored meadow and expanded wetlands.
- ▶ *Alternative 5 for the Recreation Element, East Side of the Upper Truckee Marsh:* Alternative 5 would maintain the current dispersed recreation experience on the east side of the study area. No new recreation infrastructure would be installed and public access would be afforded through the current informal user-created trail system. The Conservancy would continue to manage and reduce the impacts of recreational use and new trails while maintaining and expanding on-site signage.

- ▶ *Alternative 3 for the Recreation Element, West Side of the Upper Truckee Marsh:* Alternative 3 would upgrade the recreation infrastructure on the west side of the study area through construction of accessible trails to Lake Tahoe and formalized viewpoints that provide interpretive and site-information signage. The developed recreation experience would be maintained consistent with natural resource values.
- ▶ *Previously proposed only under Alternatives 1 and 2,* the Preferred Alternative would also include restoration of wet-meadow conditions behind the east end of Barton Beach, and the restoration of sand ridges (“dunes”) at Cove East Beach that were graded and leveled as part of the Tahoe Keys development. The sand ridge restoration would occur in conjunction with removal of fill in the southern portion of Cove East Beach and the modification and reconnection of the Sailing Lagoon to the Upper Truckee River.

A more detailed description of both the restoration and recreation elements of the Preferred Alternative is presented below. A summary of the restoration and recreation characteristics of each alternative is presented in Table 2-3. For purposes of comparison, Table 2-3 also presents the Preferred Alternative described below.

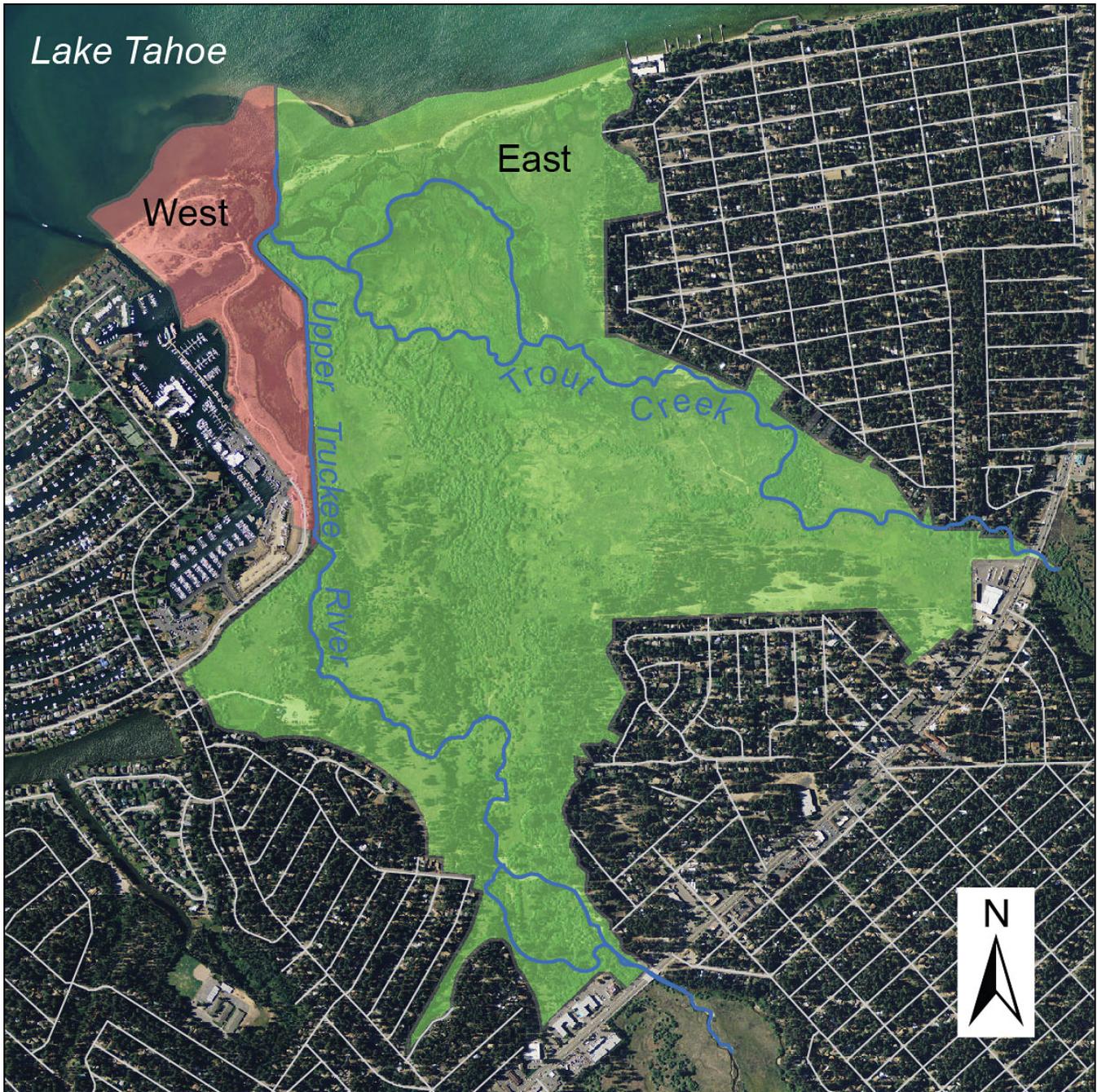
2.1.2 RIVER RESTORATION ELEMENTS OF THE PREFERRED ALTERNATIVE

The primary objective of the project is to restore natural processes and functions by decreasing channel capacity and reestablishing the channel’s connection to an active floodplain with more frequent overbanking of river flow into the adjacent Marsh and wet meadow. The active floodplain is defined as the area inundated by streamflow events that occur at least once every couple of years (i.e., 2- to 5-year storm events). For the Upper Truckee River in the study area, 2- to 5-year storm events correspond to a river flow of 760–1,660 cubic feet per second (cfs).

The Upper Truckee River downstream of the U.S. 50 bridge is incised and overly wide as a result of direct and indirect human disturbances. Consequently, the channel can convey, on average, at least 800–1,000 cfs without streamflows overbanking into the meadow. This channel capacity is more than double the geomorphic channel-forming flow, approximately 450 cfs, and most of the former (i.e., predisturbance) floodplain has become an infrequently inundated terrace. In some portions of the study area, existing channel capacity is more than 1,200 cfs, and it exceeds 2,000 cfs in the reach located the farthest upstream. Reestablishing an active floodplain and reducing channel capacity would increase the frequency and duration of overbank flows, and thus, the retention of suspended sediment on the meadow. These restored river processes would in turn enhance plant communities, aquatic and terrestrial habitat, groundwater recharge, water quality, and the ecological and aesthetic values of the study area. The geomorphic function of the river channel and its connection to the surrounding topography would be improved by both active and passive restoration means. Passive restoration downstream of a constructed pilot channel in the main marsh would replace the existing single-thread and straightened channel with a network of small channels of varied capacity. No construction would occur within the main-meadow channel sections. Therefore, the flow paths, bed and bank elevations, and channel capacities would be dictated by natural processes.

The Preferred Alternative would include the following restoration features:

- ▶ stabilization of the banks downstream of the U.S. 50 bridge to reduce sediment inputs;
- ▶ active channel restoration to raise the streambed elevation, increase the channel length, and decrease channel capacity by constructing a geomorphically sized pilot channel (about 38 feet wide and 4 feet deep) extending about 1,100 feet downstream of River Station (RS) 32+00 to reconnect with remnant channels in the Marsh;
- ▶ modification of the previously dredged river mouth to limit low-lake-level effects on surface flows;
- ▶ lowering of portions of the terrace to reestablish an active floodplain connection with the river;
- ▶ removal of existing (and reserved) fill from the floodplain to increase the area providing lagoon and meadow functions;



G 00110066.04 082

Exhibit 2-1

Eastern and Western Recreation Access Areas

Table 2-2 Summary of Benefits, Public Comment, and Feasibility Ratings for Each Alternative						
Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 (No Project/No Action)	Preferred Alternative
Restoration Element Rest						
C1— Benefits						
C2— Public Comment						
C3— Feasibility						
Eastside Access Element						
Benefits						
Public Comment						
Feasibility						
Westside Access Element						
Benefits						
Public Comment						
Feasibility						
Note: Color coded according to ratings shown in Table 2-1 above. Source: Conservancy 2014, adapted by AECOM in 2015						

Table 2-3 Elements Included in the Action Alternatives ¹					
Element	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Preferred Alternative
Restoration and Enhancement Elements					
Stabilization of Eroding Banks Downstream of U.S. 50 Bridge	✓	✓	✓	✓	✓
River and Floodplain Restoration ²	✓	✓	✓	✓	✓
River Mouth Size Reduction	✓	✓	✓		✓
Removal of Existing Fill from Floodplain	✓	✓	✓		✓
Reactivation of Floodplain Terrace			✓		✓
Modification of Existing Stormwater Discharge Locations		✓	✓		✓
Reestablishment of River Overflow Lagoon	✓	✓	✓		✓
Removal of Existing Fill from Behind the East End of Barton Beach	✓	✓			✓
Beach-Dune Restoration	✓	✓			✓
Forest Enhancement	✓	✓	✓	✓	✓
Core Habitat Enhancement	✓	✓	✓	✓	✓
East Venice Drive Bank Stabilization	✓	✓		✓	

**Table 2-3
Elements Included in the Action Alternatives¹**

Element	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Preferred Alternative
Recreation and Public Access Elements					
Bicycle Path(s)	✓		✓	✓	
Pedestrian Trail(s)		✓	✓	✓	✓
Observation Areas	✓		✓	✓	✓
Bridges	✓				
Kiosk(s)	✓		✓	✓	✓
Parking Lot	✓				
Fishing Platform	✓	✓	✓		✓
Boardwalk(s)	✓		✓	✓	
Viewpoints and Signage	✓	✓	✓	✓	✓
Notes:					
U.S. 50 = U.S. Highway 50					
¹ No-Project/No-Action Alternative does not include any of these elements.					
² River and floodplain restoration includes river channel restoration, secondary channel reactivation, floodplain lowering, and fill of abandoned channel segments.					
Source: Data compiled by Cardno in 2015					

- ▶ fill and partial fill of abandoned channel segments to increase the area providing floodplain overflow and meadow functions;
- ▶ modification of existing stormwater discharge locations and features to allow for river and floodplain restoration elements; and
- ▶ reestablishment of a river-connected lagoon.
- ▶ restoration of sand ridges (“dunes”) at Cove East Beach that were graded and leveled as part of the Tahoe Keys development.
- ▶ forest and core habitat enhancement to improve onsite resource conditions

STABILIZATION OF ERODING BANKS DOWNSTREAM OF THE U.S. 50 BRIDGE

Flow constriction and redirection under the U.S. 50 bridge create large hydraulic stresses on the steep and high streambanks downstream. This has accelerated the rates of bank erosion and fine-sediment delivery to the Upper Truckee River and ultimately to Lake Tahoe. With the willing cooperation of relevant private landowners, the Preferred Alternative would involve constructing permanent bank protection on the east bank downstream of the bridge, using geotechnical methods, bioengineering methods, or both.

Under the Preferred Alternative, the streambanks immediately downstream of U.S. 50 (from RS 0+00 to RS 13+00) would be modified. The modifications would include keyed-in boulders at the base (toe) of the bank and bioengineered revegetation above the boulders. Protection would be installed primarily on the high, actively eroding east bank, but it would also include active existing and proposed cut bank sites on the west bank. Additional protection against bank erosion would be achieved by reactivating the secondary channel from RS 5+25 to RS 11+00 and lowering the floodplain on the west bank from RS 0+00 to RS 11+00; both measures would decrease hydraulic stress on the main channel banks during high streamflows.

RIVER CHANNEL RESTORATION

The straightened Upper Truckee River channel not only has excess capacity resulting from historic dredging, but also has a uniform channel-bed morphology that is not diverse enough to support high-quality aquatic habitat. Under the Preferred Alternative, the existing straightened reach would be replaced by a constructed pilot channel to redirect most river flow into the center of the Marsh, allowing natural processes to determine low-flow paths along the meadow surface (which has appropriate, historical floodplain swales) and promote reactivation and/or formation of a new primary channel or multiple-thread channels.

The geomorphic function of the river channel and its connection to the surrounding topography would be improved by both active and passive restoration means. The active measures would raise the streambed's elevation, increase channel length, and decrease channel capacity through construction of a geomorphically sized pilot channel, approximately 1,100 feet long, 38 feet wide, and 4 feet deep, that would be connected to the existing main channel at RS 32+00. The passive restoration downstream of the pilot channel in the center of the Marsh would replace about 7,100 feet of existing single-thread channel with a network of numerous channels of varied capacity. No earthwork to reconstruct channels would occur within the main-meadow channel sections. Therefore, the flow paths, bed and bank elevations, and channel capacities would be dictated by natural processes.

The proposed main-channel alignment and profile for the Preferred Alternative would have a relatively short constructed reach. These features include two vertical grade controls to stabilize the bed elevation (at RS 32+00 and RS 99+00) and two lateral grade controls to maintain the proposed streambank position and channel confluences (at RS 32+00 and RS 95+50). In general, the control structures would be constructed of a combination of partially buried rock material and logs, with bioengineered revegetation above the future waterline. The grade control at RS 95+50 would set the bed elevation for the reconnection between the river and the lagoon, and the grade control at RS 99+00 would set the bed elevation for the river mouth. Both of these would be designed to have constructed elements that simulate the appearance and replace the function of naturally resistant subsurface geologic layers (e.g., consolidated lake sediments) that occurred in the study area, but were disturbed by historic dredging.

The Preferred Alternative includes channel stabilization on the lower section of Trout Creek. Redirected flows from the Upper Truckee River would pass through the remnant channel system in the middle of the Marsh and increase streamflow conveyed through the lowest reach of Trout Creek. This would create the potential for future channel adjustments such as bed or bank erosion within a section that historically experienced bed erosion as a response to dredging of the main channel. Therefore, the Preferred Alternative includes installation of vertical grade control(s) and streambank stabilization measures along up to 2,600 feet of lower Trout Creek (from RS 66+00 to RS 95+50). The vertical grade controls would be of an adequate number and design to maintain the existing average slope and bed elevation of the channel and remain stable under the 100-year peak flows, assuming the combined peaks of Trout Creek and the Upper Truckee River. The streambank stabilization measures would be designed to remain stable under the 10-year peak flows, assuming the combined peaks of Trout Creek and the Upper Truckee River. Their design would anticipate and address the potential effects of sheet and concentrated overflow returning to the channel off the reactivated floodplain. The proposed treatment types would prioritize the use of bioengineered, living vegetative treatments above the normal water line, but could require the use of buried rock under the channel bed for grade control features.

For floodplain areas with remnant channels having accumulated fine sediment and/or organic materials, final project design and revegetation specifications would include measures to minimize the risk that such materials would become mobilized if a large flood flow were to occur during the first few years after construction. As feasible, the measures would remove and/or stabilize the materials adequately to resist expected erosive forces if a large flood (i.e., 25-year and higher peak flow) were to occur within the first 5 years after implementation. The following measures would be implemented:

- ▶ Remove loose, unvegetated, or otherwise unstable fine sediment and/or organic material within the remnant channel sections to be reactivated (either directly connected to the restored channel or as part of reactivated floodplain) to eliminate the potential pollutant source. The excavated materials could be salvaged for soil amendment and revegetation use in off-channel areas if suitable or disposed of properly off-site.
- ▶ Revegetate loose, unvegetated, or otherwise unstable fine sediment and/or organic material along the remnant channel sections to be reactivated (either directly connected to the restored channel or as part of the reactivated floodplain) to increase roughness and reduce velocities. Revegetation of these areas would meet species, density, planting methods, irrigation, and success criteria similar to streambank plantings.

RIVER MOUTH SIZE REDUCTION

The incised and previously dredged river mouth is overly wide and deep, allowing lake water inflow even during relatively low water surface elevations in the lake (i.e., low lake stands). The mouth configuration and the incised bed of the straightened river reach allow lake backwater effects to extend more than 2,000 feet up the river during high lake stands and, to a somewhat lesser extent, during lower lake stands. The lake backwater reduces flow velocities, reduces hydraulic complexity, flattens the channel bed, and limits habitat diversity. Although the project is not intended to address the backwater conditions normally expected during high lake stands, the Preferred Alternative includes modifications to the river mouth that would decrease its width and limit inflow of lake water during low lake levels.

The Preferred Alternative would install resistant materials to reestablish the approximate elevation of consolidated sediment underlying the channel that existed before the river was channelized. The existing river mouth location downstream of RS 95+50 would be retained, but the minimum bed elevation would be supported by a vertical grade control feature and the capacity would be reduced at RS 99+00 by installing both an engineered grade control and bioengineered revegetation. The grade-control structure would be designed to simulate the function of naturally-occurring subsurface geologic layers (i.e., resistant, cohesive lake sediments) to hold the minimum stream bed elevation at approximately 6,222 feet. This would be lower than median lake level but would restore a higher bed than the historic dredged depth. Existing woody vegetation in the areas disturbed for grade control would be salvaged and transplanted as part of the bioengineered revegetation activities. Over time, vegetation growth along the channel margins between the reconstructed lagoon outlet and the beach ridge would increase roughness, encourage aggradation, and protect against erosion.

FLOODPLAIN LOWERING

With the willing cooperation of relevant private landowners, the Preferred Alternative would improve the hydrologic connectivity of the channel and floodplain by lowering portions of the terrace in the narrow upstream reach. During lowering of the terrace, existing woody vegetation along the margins would be preserved to the extent possible, to retain the erosion resistance provided by vegetation. The surface of restored floodplains would be revegetated with a mixture of salvaged/transplanted sod and willow, willow wattles, and new plantings.

Three lowered floodplain areas (covering 315,950 square feet) would be excavated into the existing terrace surfaces to improve floodplain function from RS 0+00 to RS 5+00, RS 5+25 to RS 11+00, and RS 21+00 to RS 29+00. From RS 0+00 to RS 5+00, the excavation would cover about 41,100 square feet between the main channel and the building pad of the adjacent commercial development, averaging about 3.0 feet deep. From RS 5+25 to RS 11+00, the excavation would cover about 82,400 square feet west of the main channel, averaging about 2.5 feet deep. From RS 21+00 to RS 29+00, the excavation would cover about 192,450 square feet east of the main channel, averaging about 1 foot deep.

REMOVAL OF EXISTING FILL FROM FLOODPLAIN

In addition to the floodplain restoration described in the preceding section, the Preferred Alternative would restore floodplain function by excavating up to approximately 29,940 cubic yards of reserved fill to meet native ground elevation on about 147,900 square feet of the Lower West Side (LWS) Restoration Area. The reserve fill areas include approximately 130,250 square feet stored as “islands” adjacent to the existing channel and another 17,650 square feet of high ground between the LWS floodplain and the existing trail.

With the willing cooperation of TKPOA, the Preferred Alternative would also restore floodplain function by excavating about 5,100 cubic yards of previously placed fill at the TKPOA Corporation Yard, creating topography similar to adjacent natural surfaces, over an area of about 91,700 square feet.

If chemically and physically suitable, the excavated fill from either location would be used to backfill channel segments; otherwise, the material would be hauled to an appropriate off-site disposal site. After removal of existing fill, the entire restored floodplain surface and all disturbed areas would be revegetated with a mixture of salvaged/transplanted sod and willow, willow wattles, and new plantings.

FILL OF ABANDONED CHANNEL SEGMENTS

Where new channel segments would replace existing segments, the abandoned channel segments would be partially or completely filled. The backfilled channels and all other disturbed areas would be revegetated with a mixture of salvaged/transplanted sod and willow, willow wattles, and new plantings. The construction specifications for the filling of abandoned channels would be prepared by a qualified engineer and include standards that minimize the potential for erosion or recapture of the backfilled channels. The specifications would include compaction standards to avoid significant density differences between the fill and surrounding floodplain sediments, improve groundwater connectivity, and provide near-surface soils suitable for revegetation success. The specifications would be developed on the basis of the range of physical attributes of the soils encountered, but would generally require that fill density be within 10 percent of the average density of natural soils. Additionally, the specifications would specify maximum slope angles for the slope formed at the edges of the fill (also dependent on soil properties) and vegetative cover.

Complete backfill of about 1,700 feet of existing channel (between RS 91+50 and RS 75+00) would bring the abandoned channel areas up to meet the elevation of adjacent floodplain surfaces and restore floodplain function to about 97,146 square feet along the LWS wetlands. Partial backfill of about 4,200 feet of old channel (from RS 75+00 to RS 342+00) would provide about 165,202 square feet of floodplain swale that would become active only during moderate to large flow events.

REACTIVATION OF FLOODPLAIN TERRACE

Floodplain function and connectivity would be improved across U.S. 50 and between the main channel and the building pad of the adjacent commercial development by boring two overflow culverts through the roadfill. Two corrugated metal pipes would be installed, with the upstream inlet at an elevation that would receive water when the channel upstream of the bridge was out of bank. The culverts would have a flow capacity of about 150 cfs. The culverts would begin taking flow when the river flow is around 2,000 cfs (between the 5-year and 10-year event). The downstream outlet would have a rock-lined, energy dissipation–flared section that would activate the isolated terrace west of the channel from RS 0+00 to RS 5+00 (that would become lowered floodplain). The overflow culverts would also provide a small reduction in high flows that would be conveyed under the U.S. 50 bridge, to reduce hydraulic stress on the main channel’s banks during large streamflows. These measures would require easements and approvals from the California Department of Transportation (Caltrans) and relevant private landowners.

MODIFICATION OF EXISTING STORMWATER DISCHARGE LOCATIONS

River and floodplain modifications for the Preferred Alternative would require relocating and/or modifying existing stormwater discharge locations near RS 46+50 and RS 66+00. At locations near the existing discharge points, stormwater basins would be installed (either excavated within native meadow material or configured within a portion of the backfilled abandoned channel). The basins would replace the discharge function of existing outfalls directly to the river. Therefore, they would also increase the pretreatment of urban runoff before release into open surface water of the Upper Truckee River, by providing opportunities for settling, infiltration, and percolation. The size and volume of the features would be determined in consultation with the City of South Lake Tahoe (CSLT), the Lahontan Regional Water Quality Control Board (RWQCB), and TRPA, but the overall shape would simulate naturally occurring floodplain features and would be vegetated with native plant species.

REESTABLISHMENT OF A RIVER-OVERFLOW LAGOON

The lagoon area connected with the Upper Truckee River is a natural feature that was likely larger before human disturbance. The surface water of the dredged lagoon (the Sailing Lagoon) is hydrologically connected to Lake Tahoe through the Tahoe Keys Marina channel. The Sailing Lagoon is not connected to the river. It has been part of Tahoe Keys Marina since the 1950s, produced by dredging and fill activities to provide for various navigation routes.

The Preferred Alternative would reestablish a hydrologic connection between a restored, naturally functioning lagoon in the general location of the existing Sailing Lagoon and the Upper Truckee River near the river mouth by (1) constructing a bulkhead at the Sailing Lagoon to block its open connection with the marina and Lake Tahoe, and (2) topographically modifying the Sailing Lagoon, including creation of a reexcavated connection with the Upper Truckee River so that the river would become a surface-water source to the lagoon. (The bulkhead would be located approximately 30 feet east of the existing opening within the marina.) The restored lagoon would be analogous to what exists behind Barton Beach near Trout Creek, but on a larger scale (approximately 105,000 square feet). To restore the natural river/lagoon connection, an engineered 290-foot-long sheet pile bulkhead and earthen levee would be constructed across the dredged west end of the Sailing Lagoon approximately 30 feet east of the existing bulkhead along the marina, and the fill blocking the east end would be removed. Final design would include a flow control feature to prevent erosion when river overflows enter the lagoon (particularly if the lagoon water surface is low). The control feature (e.g., a rock-lined channel or boulder weir structure) would be designed to control the location of overflow into the lagoon and prevent the development of a permanent, uncontrolled erosive channel connecting the river to the lagoon.

Invasive species would be addressed through development and implementation of an invasive species management plan as described in Environmental Commitment 4 (see Table 2-7). Following control and removal of invasive animals and plants, local cut and fill would then be used to recontour the topography of the lagoon and connect levee areas with adjoining ground. The lagoon, levee, and all disturbed areas would be revegetated using a mixture of woody and herbaceous species, suited to the anticipated range of moisture conditions from lagoon bed to levee crest. The east end of the lagoon connection with the river would be constructed as a vertical grade-control structure to simulate the appearance and function of naturally occurring resistant geologic layers and would include bioengineered revegetation to increase erosion resistance along the shared bank between river and lagoon. A grade-control structure would set the minimum bed elevation to protect the west bank from erosion and establish a residual lagoon water surface elevation during low lake levels.

Salvaged soil and vegetation (after screening out of invasive species) would be used, along with plantings, to revegetate the proposed lagoon area, using a mixture of native plant species appropriate for planned water depths.

The Preferred Alternative would remove existing fill from behind the east end of Barton Beach to restore lagoon and wet-meadow conditions. Removal of this fill would restore lagoon and wet-meadow conditions on about 18,000 square feet. Fill would be excavated to native ground elevation, at a depth averaging about 2 feet.

Salvaged soil and vegetation would be used, along with plantings, to revegetate the restored lagoon and wet meadow, using a mixture of native plant species appropriate for planned elevations. Previously, this component was proposed only under Alternatives 1 and 2.

OVERBANK FLOW AND FLOODING CONSIDERATIONS

Under existing conditions, the incised and widened channel does not allow natural overbank flow onto the meadow during small or moderate streamflow events, an important factor for sustaining ecological values of the adjacent marsh and wet meadow. The channel is overtopped only during relatively large flows (approximately 1,000 cfs or greater). The Preferred Alternative would use a combination of modifications and reactivation of the existing channel(s) and/or construction of a new channel to decrease the elevation difference between the channel bed and the adjacent meadow, and to reduce channel capacity to a more geomorphically appropriate size. These changes would reestablish and enlarge an active floodplain that receives overbank flows during small events (e.g., the 2- to 5-year storm events).

The existing flood hazard affecting adjacent neighborhoods would not be increased by the Preferred Alternative. The alternatives would improve the active floodplain's storage volume and flow routing in the valley reach, but would not alter storage for the overall 100-year floodplain. During lower magnitude flow events, floodplain storage would be increased by lowering portions of the floodplain and partially backfilling of the abandoned channel. Hydraulic modeling using a two-dimensional, calibrated model of existing conditions and the Preferred Alternative configuration was used to verify that overbank flows could be increased for smaller flow events without an increase in flooding hazards. Additional information on flood hazards is presented in Chapter 3, "Master Responses".

2.1.3 TERRESTRIAL HABITAT RESTORATION AND ENHANCEMENT ELEMENTS OF THE PREFERRED ALTERNATIVE

In addition to the restoration and enhancement of aquatic habitats and floodplain hydrologic and geomorphic processes, the Preferred Alternative would also restore and enhance terrestrial habitats. This restoration and enhancement elements would include the restoration of riparian habitats in conjunction with river channel and floodplain restoration, and also beach dune restoration, forest enhancement, and enhancement of core habitat. These terrestrial habitat restoration and enhancement elements of the project are described below.

WILLOW SCRUB–WET MEADOW RESTORATION

The Preferred Alternative would create additional willow scrub–wet meadow along the pilot channel, on the lowered or restored floodplains, in some backfilled channel segments, and in other locations.

MONTANE MEADOW RESTORATION

Montane meadow would be restored at the TKPOA Corporation Yard under the Preferred Alternative. The restoration of the corporation yard would be contingent on the consent of TKPOA.

DUNE/BEACH RESTORATION

The Preferred Alternative includes the restoration of sand ridges ("dunes") at Cove East Beach that were graded and leveled as part of the Tahoe Keys development. The restoration would occur in conjunction with removal of fill in the southern portion of Cove East Beach and the modification and reconnection of the Sailing Lagoon to the Upper Truckee River. Approximately 8,524 cubic yards of soils from lagoon margin grading would be reused in configuring the restored dunes.

FOREST ENHANCEMENT

The Preferred Alternative includes enhancement of Jeffrey pine and Lodgepole pine forests near the Highland Woods subdivision that have been disturbed by past land uses. Enhancement measures would include the removal or relocation and restoration of user-created trails and some other disturbed areas and invasive-plant control. In particular, these enhancements would be intended to improve the quality of edge habitat between the Marsh and the forest and to provide important habitat for terrestrial wildlife species. The acreage of these enhancements is proposed is approximately 7.7 acres.

ENHANCEMENT OF CORE HABITAT

The Preferred Alternative would enhance an area of “core habitat” that contains sensitive marsh habitats in the center of the study area (251 acres). The enhancement of this area would be intended to provide greater quality habitat by being exposed to less human disturbance. The edges of the core habitat areas would be approximately 150 feet from potential sources of disturbance of wildlife by humans (i.e., study area boundaries, access trails, or the river). Recreational access within the core habitat area would be discouraged through removal of existing user created trails to native vegetation. Because the Preferred Alternative would move the river to the middle of the Marsh, this alternative could potentially allow recreational use to expand further into the Marsh from the west side of the study area than Alternatives 1, 2, 4, and 5. However, this alternative would create additional wet marsh conditions east of the existing channel, a condition that would limit human activities during spring and early summer.

2.1.4 PUBLIC ACCESS AND RECREATION INFRASTRUCTURE ELEMENTS OF THE PREFERRED ALTERNATIVE

Project objectives include balancing public access and recreation infrastructure construction and operation with habitat restoration and protection. Five main assumptions guided the design of the public access and recreation infrastructure:

1. Based on the study area’s location (i.e., adjacent to neighborhoods and a high-use recreation area [Tahoe Keys Marina]) and existing use patterns, people would continue to use the Upper Truckee Marsh to some degree, even with some level of access restrictions.
2. To most effectively protect sensitive wildlife and plant habitat, public access would need to be allowed and managed to the extent that most visitors would be satisfied with their level of access and would not intrude into sensitive areas.
3. Excessive levels of recreation infrastructure and access would compromise the quality and function of sensitive habitats by promoting high levels of disturbance. However, too many overall restrictions would encourage uncontrolled access to sensitive areas.
4. Although public-access and recreation elements, such as pedestrian trails, would disturb vegetation and wildlife directly and indirectly, these features, if designed appropriately, could be valuable tools for directing most access away from sensitive habitats while maintaining existing recreation opportunities.
5. Some level of well-designed public access infrastructure in nonsensitive areas, combined with protective elements and environmental education, would be the most effective approach to protecting sensitive wildlife habitat in the study area.

Also, the 1988 litigation settlement leading to the acquisition of the Cove East Beach property in the northwest corner of the study area requires that recreational beach access west of the river mouth be maintained (*People of the State of California vs. Dillingham Development Company and TRPA*, CIV-S-85-0873-EJG [February 25,

1988]). Therefore, the focus of the elements west of the Upper Truckee River, near the LWS Restoration Area and Cove East Beach, are intended to provide public access and recreation, while the approach for the east and south sides of the study area is intended to protect habitat and allow continued existing public access away from sensitive areas of the Marsh and thus contribute to the protection of wildlife and sensitive habitat.

On the east side of the Upper Truckee Marsh no recreation improvements are currently proposed (e.g., viewpoints or additional trails); however, existing infrastructure would continue to be maintained and future nondiscretionary enhancements might result in the construction of some additional, smaller elements (e.g., signage). To the west and south of the river, proposed recreation improvements include relocation of the pedestrian trail to Cove East Beach, one viewpoint, observation area, kiosk, fishing platform, and signage.

The infrastructure proposed for recreation and public access elements of the Preferred Alternative is presented in Exhibit 2-2 and in further detail in Appendix A.

PEDESTRIAN TRAILS

Under the Preferred Alternative, the existing trail providing public access to Cove East Beach would be partially rerouted along the restored wetlands, lagoons, and dunes while still maintaining access to the shore of Lake Tahoe. The rerouted trail would be consistent with Americans with Disabilities Act (ADA) guidelines. No additional trails or bicycle paths would be constructed on the east side of the Upper Truckee River. Access along the eastern perimeter of the study area would continue through informal trails.

VIEWPOINTS AND OBSERVATION AREAS

Under the Preferred Alternative, no viewpoints would be constructed along the east edge of the study area. On the west side of the study area, one viewpoint would extend from the northeast corner of the loop trail near Cove East Beach. The existing shore zone and river mouth in this area experience high levels of recreational use and disturbances to vegetation, soils, and wildlife. The new viewpoint would provide views across the river mouth and out across the lake as well as views of the meadow and lagoon to the east. This viewpoint would direct some recreation use away from those areas, reducing disturbances to waterfowl and shorebirds. West of the Upper Truckee River, by Cove East Beach, an observation area would be connected to the pedestrian trail to Cove East Beach.

FISHING PLATFORM

The Preferred Alternative includes a fishing platform that would be constructed on the edge of the new river-connected lagoon; it would be connected to and accessed by the loop trail around the perimeter of Cove East Beach.

SIGNAGE AND KIOSK

The Preferred Alternative would include development of an interpretive program and installation of additional signage in appropriate locations (e.g., along trails, at viewpoints, and near sensitive habitats). This signage would include educational, directional, and safety information to provide public access and dispersed recreation opportunities. Signs would provide maps at trailheads to illustrate the location of open public trails and closed areas throughout the study area. Signs would also be placed near sensitive habitats to discourage disturbance of those areas by people and pets, and to stimulate a resource stewardship ethic in the public.

The Preferred Alternative would include an interpretive kiosk that would provide information to support public access, recreation infrastructure, and visitor education and interpretation of the ecological values of the Upper Truckee Marsh (e.g., maps and information regarding sensitive resources). The kiosk would be constructed on high-capability land near the end of East Venice Drive adjacent to the Tahoe Keys Marina.

2.2 RESOURCE MANAGEMENT

The Conservancy maintains existing infrastructure to support safe public access, recreation, and habitat protection measures in the study area. The agency's ongoing management actions include the following:

- ▶ **Maintenance of Facilities.** The Conservancy monitors the condition and use of existing facilities, removes litter and fire pits, and eliminates potentially hazardous conditions (e.g., user-created facilities such as makeshift bridges). Also, the Conservancy funds the Tahoe Resource Conservation District to contract with the Clean Tahoe Program for trash removal services, including weekly inspection and maintenance of 12 garbage cans located throughout the property.
- ▶ **Monitoring and Outreach.** Through a land steward, the Conservancy conducts outreach to educate visitors regarding the importance of resource protection and to discourage incompatible uses.
- ▶ **Enforcement of Policies.** The Conservancy contracts with the El Dorado County Sheriff's Office to provide security patrols in the study area and to enforce local ordinances. The Conservancy also monitors recreational use and compliance with Conservancy use policies and CSLT ordinances.
- ▶ **Mosquito Control.** The Conservancy regularly communicates with El Dorado County Vector Control District regarding mosquito production and control. In consultation with the El Dorado County Vector Control District, the Conservancy provides necessary measures for controlling mosquito production.
- ▶ **Invasive Species Control.** The Conservancy monitors for the presence of priority invasive species, and to the extent practicable, it implements appropriate measures to control and eradicate populations. The Conservancy also coordinates with the Lake Tahoe Basin Weed Coordinating Group and the Aquatic Invasive Species Working Group regarding the control of invasive species.
- ▶ **Management of Tahoe Yellow Cress (TYC) Habitat.** The Conservancy has prepared and implements a management plan for TYC in the study area. This management plan contains a number of management actions, including:
 - maintaining an enclosure to protect the Upper Truckee East TYC population and regularly evaluating the effectiveness of its design and placement;
 - participating in basinwide TYC monitoring activities; and
 - implementing the Imminent Extinction Contingency Plan, if necessary.

Under the Preferred Alternative, this management would continue. Additional management actions that would be implemented as part of the project are described in Section 2.5, "Environmental Commitments."

2.3 MONITORING

A monitoring framework was developed for this and other restoration projects on the Upper Truckee River to:

- ▶ characterize baseline conditions,
- ▶ track project performance related to desired outcomes,
- ▶ document effects on relevant TRPA environmental threshold carrying capacities,
- ▶ establish tentative approaches to monitoring for regulatory requirements, and
- ▶ provide information to direct adaptive management.

Legend

- Project Boundary
- Existing 1000 ft. River Station
- Existing 100 ft. River Station - Upper Truckee
- Existing 100 ft. River Station - Trout Creek
- Existing Regional Bike Trail

Proposed Habitat Features

- Restored Lagoon
- Restored Meadow
- Tahoe Yellow Cross Restricted Use Area
- Reveg and Streambank Enhancement
- Restored Dune

Proposed River and Floodplain Features

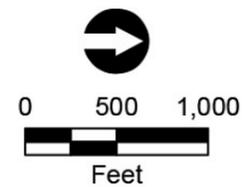
- Low and Bankful Flow Channel
- Potential Low Flow Path
- Active Floodplain
- Removal of Reserve Fill
- Partial Fill of Existing Channel
- Channel Backfill
- Floodplain Areas of Excavation

Proposed Engineered Features

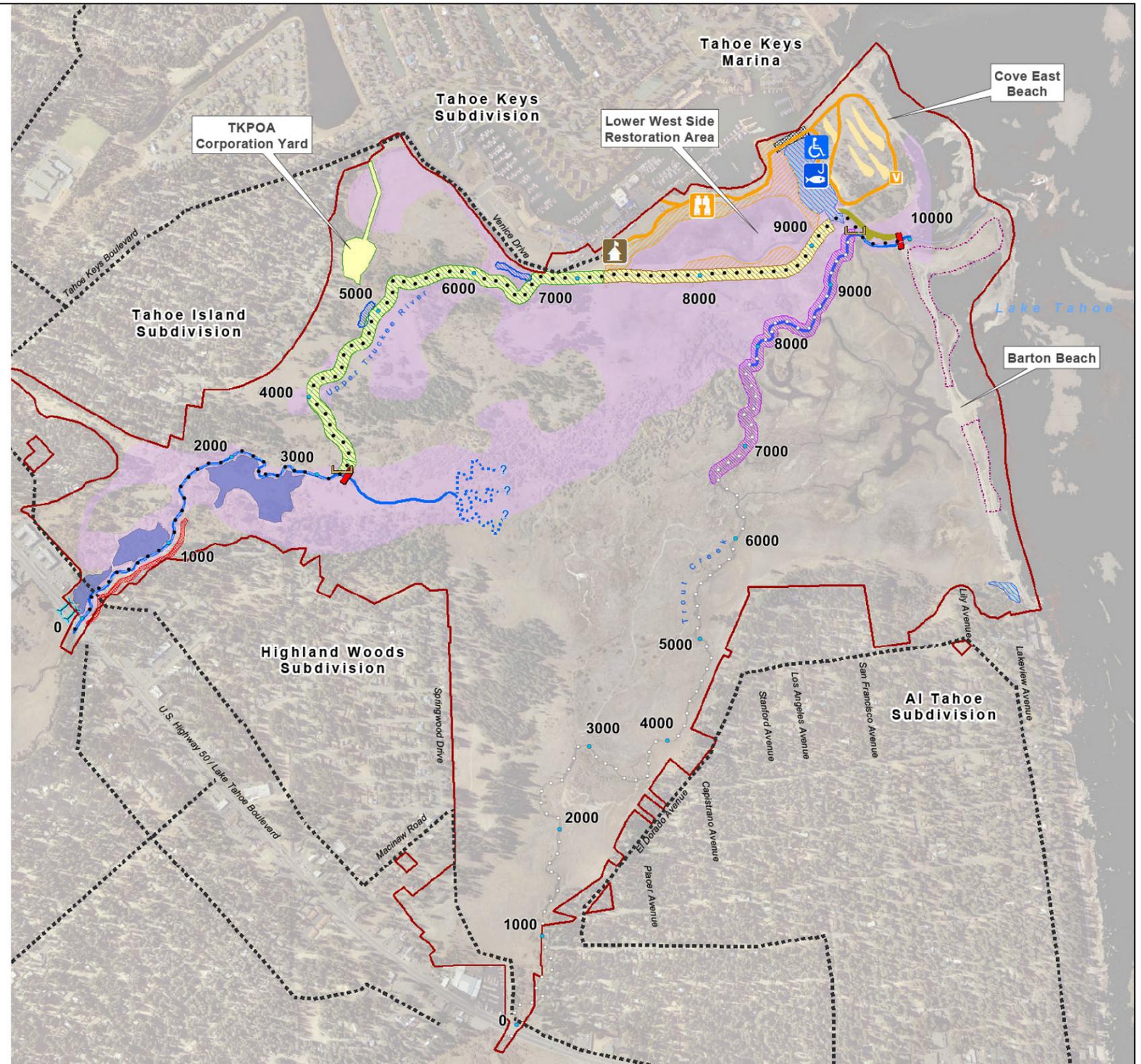
- Lateral Grade Control
- Vertical Grade Control
- Bulkhead/Levee
- Bank Protection
- Storm Water Treatment Area
- Overbank Conveyance Bridge Modification
- Channel Grade Control and Bank Protection

Proposed Public Access Features

- Viewpoint
- Pedestrian Trail
- Fishing Platform
- ADA Accessible
- Observation Area
- Kiosk



G 00110066.04 083



Source: Cardno

Exhibit 2-2

Proposed Infrastructure for Recreation and Public Access Elements of the Preferred Alternative

Project-specific monitoring would coordinate prior, existing, and anticipated monitoring to the extent practicable, and to be consistent with the guidance developed by the Upper Truckee River Watershed Advisory Group (Conservancy 2007).

Although the monitoring plan is intended to identify tentative approaches to anticipated regulatory requirements for monitoring of project impacts on the river, riparian, and marsh habitats, additional monitoring might be required. Permit conditions will not be known until a restoration plan has been approved by regulatory agencies.

The monitoring plan will describe the variables selected as indicators and will summarize each protocol, quality assurance mechanisms, and reporting procedures. The protocol summaries described in the framework include sampling design (i.e., location and timing of data collection), data collection methods, and guidance for data analysis. These protocol summaries are provided for:

- ▶ topographic surveys,
- ▶ groundwater elevation measurements,
- ▶ discharge measurements,
- ▶ overbank flow measurements,
- ▶ inundation mapping,
- ▶ vegetation mapping,
- ▶ quantitative vegetation sampling,
- ▶ stream bioassessment,
- ▶ avian counts,
- ▶ nest searching and monitoring,
- ▶ small-mammal trapping,
- ▶ electrofishing,
- ▶ water quality monitoring, and
- ▶ qualitative site assessment.

Monitoring of TYC conditions in the study area is described in a separate management plan prepared for that plant species (Conservancy and DGS 2007:24–31). The monitoring of TYC would continue to be part of the interagency monitoring of the species throughout the Tahoe Basin, which includes a census of all known populations and systematic searches of areas supporting unoccupied, potentially suitable habitat.

2.4 CONSTRUCTION

2.4.1 OVERVIEW

This section summarizes the likely proposed construction activities and overall schedule. Construction would generally occur between May 1 and October 15 each year for approximately 4 years. Construction is expected to begin in 2019. The actual construction schedule and phasing may vary from what is presented below depending on permit and easement requirements, final design, and the selected contractor. Construction activities would occur from 8:00 a.m. to 6:30 p.m. pursuant to Section 68.9 of the TRPA Code of Ordinances. Exceptions may be granted if it can be shown that construction beyond these times is necessary to alleviate traffic congestion and safety hazards.

Each year, construction activities would begin with mobilization, including construction and maintenance of haul roads and staging areas, installation or maintenance of BMPs, and installation of signage in the project vicinity. Similarly, each year, closing activities would include winterization (i.e., installing BMPs in disturbed areas, demobilizing equipment, stabilizing access roads, and shutting down the irrigation system) and, in Year 4, project shutdown.

2.4.2 CONSTRUCTION ACTIVITIES AND SCHEDULE

The construction activities that are anticipated to occur each year to implement the Preferred Alternative are described below. Exhibit 2-3 shows public-road access locations, prospective haul routes, and potential storage/staging areas (some or all of the areas may be required and used, pending authorization for those on private properties). Table 2-4 presents the staging area acreages. Table 2-5 lists a likely sequence of activities for the engineered elements associated with the Preferred Alternative and the estimated duration of each activity. This table includes all proposed activities on public lands as well as those that are contingent upon private landowner agreements. Therefore, the actual sequence and phasing, including temporary stockpiling needs, could vary.

YEAR 1

Year 1 construction activities would commence with mobilization activities that would take up to 1 month to complete. These mobilization activities would include constructing staging areas and haul roads, installing BMPs, and placing signage. Expected activities would include delivery and storage of construction equipment and materials and establishing worker parking. Public roads would be used to access the staging areas. All construction equipment and haul trucks would operate on internal haul roads.

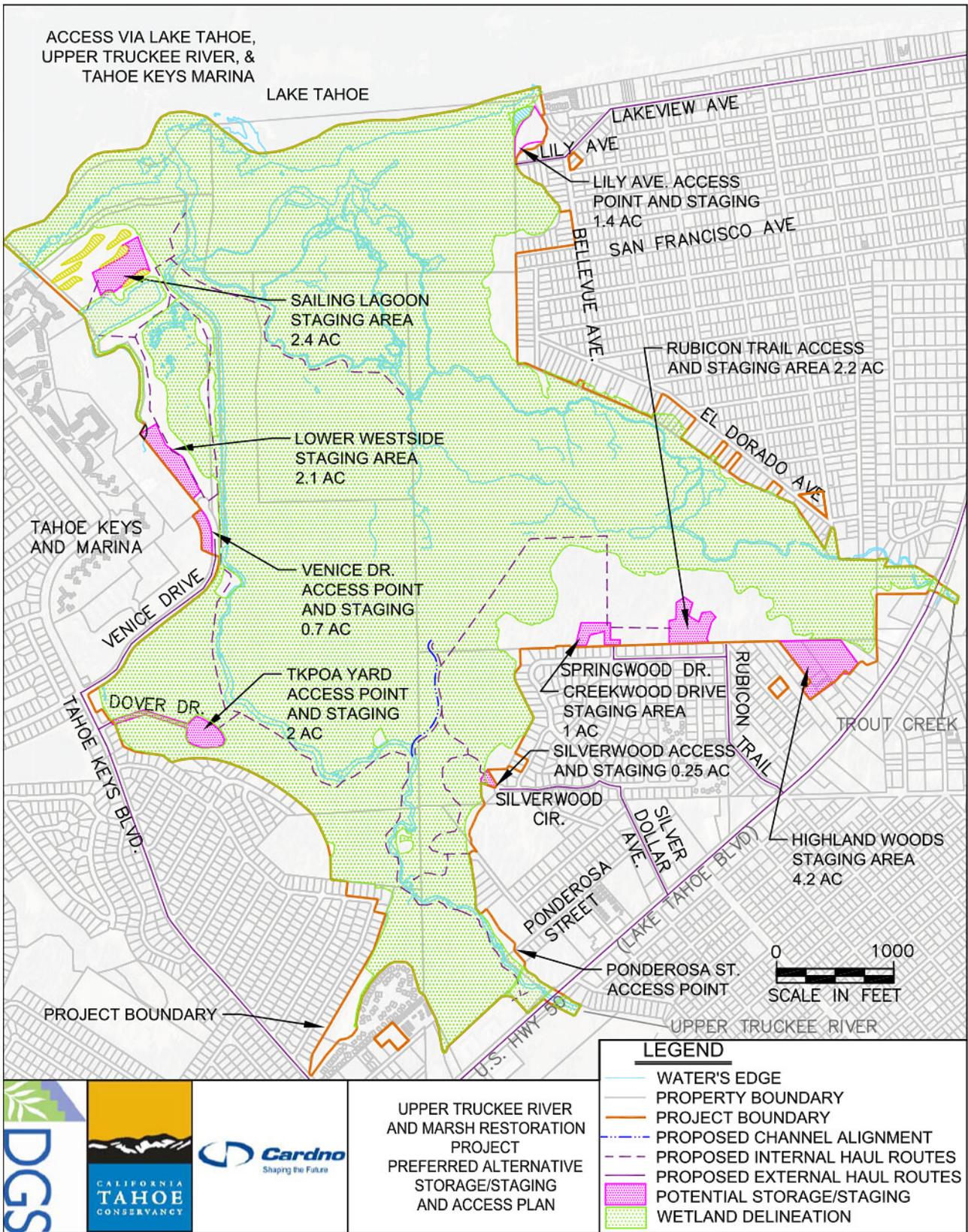
Subsequent activities would include much of the earthwork required for the river and floodplain grading: lowering the terrace sections and recontouring existing secondary channels (on private lands), and constructing the pilot channel, vertical grade control, and install bank protection measures. These activities would require 1–3 months to complete.

Significant excavation and soil movement activities would occur on-site in Year 1. The excavated material that is not required for reuse in the same year would be stockpiled temporarily on-site at one of the storage areas, prioritizing those outside of the 100-year floodplain. The excavated materials would be transported to the staging areas on haul roads. After excavation, permanent revegetation and temporary irrigation would be installed in work areas at final grade, as soon as possible. The general haul route for the off-site sediment transport would likely be from Venice Drive to Tahoe Keys Boulevard and then to U.S. 50.

During construction of channels, it is possible that dewatering of excavations (i.e., removal of collected water) may be required. To minimize the potential for dewatering, construction activities within the live channel would be avoided whenever possible. When construction within the live channel is required, barriers would be used to isolate the work areas from any flowing water. Seepage into the isolated work areas would be pumped and used for irrigation and dust control. If the quantities of water were to exceed the demands for dust control or could result in irrigation runoff, temporary and portable detention basins would be constructed. The basins would be created using portable containment berms and used to store and treat the groundwater effluent. The stored water would be used for irrigation or dust control or treated to meet surface-water discharge requirements and discharged back into the live channel.

YEAR 2

During Year 2, revegetation and irrigation work would continue on the pilot channel, secondary channels, and lowered floodplain modifications. The streambed and bank stabilization on lower Trout Creek would be completed. Vertical grade controls would be constructed at the downstream end of the site (by the Trout Creek confluence and at the river mouth). Overflow culverts would be installed under U.S. 50 through the embankment fill. Throughout the construction season, the revegetation treatments conducted during Year 1 would be irrigated and inspected.



Source: Cardno 2015

Exhibit 2-3

Preferred Alternative—Storage/Staging and Access Plan

**Table 2-4
Staging Area Temporary Impacts**

Staging Area	Square Feet	Acres
TKPOA Yard	86,504	1.99
Creekwood	41,983	0.96
Rubicon Trail	96,509	2.22
Highland Woods	183,563	4.21
Silverwood	10,970	0.25
Lily Avenue	60243	1.38
Sailing Lagoon	107,838	2.48
Lower Westside	92,377	2.12
Venice	32,270	0.74

Source: Data compiled by Cardno in 2015

**Table 2-5
Sequence and Duration of Activities for Engineered Elements of the Preferred Alternative**

Activities/Engineered Element	Duration (months)
YEAR 1 ACTIVITIES	
Mobilization. Build haul roads and staging areas. Install BMPs and place signage.	1
Lowered Floodplain. Excavate the existing terrace between RS 0+00 and RS 5+00, RS 5+25 and RS 11+00, and RS 18+00 and RS 29+00. Haul excavated material that is not reused to the on-site TKPOA Corporation Yard, LWS, or Sailing Lagoon staging areas (or alternatively to the Rubicon Trail or Highland Woods staging) for stockpiling until it is used for backfill in Year 3.	2
Existing Secondary Channel. Excavate the elevation of the inlet and outlet of the existing secondary channel (west high-flow channel) at RS 05+25 and RS 11+00 to an elevation that allows flow into the secondary channel when the total flow exceeds the design flow of the main channel. Recontour the existing secondary channel (east high-flow branch) between RS 18+00 and RS 29+00 to function as part of the lowered floodplain.	0.5
Pilot Channel and Vertical Grade Controls. Excavate the pilot channel off the main river channel near RS 32+00 with a top width of approximately 38 feet and average depth of 4 feet. Haul any of the excavated material that is not reused to the TKPOA Corporation Yard (or other staging areas) for stockpiling until it is used for backfill in Year 3. Construct vertical grade-control structure at RS 32+00 on the new low-flow alignment (pilot channel) to stabilize the elevation of the inlet of the new channel. Leave a protective plug of native material in place and/or install temporary protective measures within the pilot channel to retard flow velocities and depths until Year 3.	2.5
Bank Protection. Construct bank protection between RS 0+00 and RS 13+00.	2
Revegetation/Irrigation. Conduct permanent revegetation and install temporary irrigation as soon as feasible in all work areas at final grade.	1
Winterization. Install BMPs on all disturbed areas, “demobilize” all equipment from the site, remove or stabilize all access roads, and shut down the irrigation system.	0.5
YEAR 2 ACTIVITIES	
Mobilization. Inspect and/or rebuild haul road and staging areas. Reinstall BMPs as needed and restart the irrigation system.	1

Table 2-5	
Sequence and Duration of Activities for Engineered Elements of the Preferred Alternative	
Activities/Engineered Element	Duration (months)
Pilot Channel, Existing Secondary Channel, and Lowered Floodplain. Inspect to evaluate the condition of Year 1 grading and revegetation. Initiate irrigation as soon as possible and inspect revegetation monthly.	5
Overflow Culverts. Construct overflow culverts under U.S. 50 through the embankment fill. Culverts are to be plugged and remain so until lowered floodplain has sufficient revegetation.	1.5
Vertical Grade Controls and River Mouth Modification. Construct vertical grade-control structure(s) and streambank stabilization measures along about 2,600 feet of lower Trout Creek (from RS 66+00 to RS 95+50) to stabilize the existing bed elevation, and at RS 99+00 on the Upper Truckee River to raise existing bed elevation. Install bioengineered revegetation at and around structures.	2
Bulkhead and Levee. Install vertical sheet pile bulkhead extending from approximately 30 feet east of the existing sheet pile along the Tahoe Keys Marina channel. Isolate the Sailing Lagoon, pump/drain, and excavate sediment (including invasive plants and animals if present). Haul sediment unsuitable for reuse to a permitted off-site disposal area. Construct an earthen levee along the east side of the sheet pile bulkhead contoured to meet desired lagoon shape.	2
Restored Lagoon. Recontour the Sailing Lagoon, aside from the area near RS 93+00 where it will later be reconnected to the river (in Year 3).	1
Revegetation/Irrigation. Conduct permanent revegetation and install temporary irrigation at final grade as soon as feasible in all work areas.	1
Winterization. Install BMPs on all disturbed areas, “demobilize” all equipment from the site, remove or stabilize all access roads, and shut down the irrigation system.	0.5
YEAR 3 ACTIVITIES	
Mobilization. Inspect and/or rebuild haul road and staging areas. Reinstall BMPs as needed and restart the irrigation system.	1
Recontoured Existing Channel, Existing Secondary Channel, and Lowered Floodplain. Inspect to evaluate the condition of prior grading and revegetation. Initiate irrigation as soon as possible and inspect revegetation monthly.	5
Excavation of Reserve Fill at LWS Restoration Area and Fill at TKPOA Corporation Yard. Excavate reserve fill located at the LWS Restoration Area and fill at the TKPOA Corporation Yard for storage and then reuse in backfilling the existing channel.	1
Public Access and Recreation Infrastructure Elements. Construct all public-access facilities and recreation infrastructure elements.	1.5
Restored Lagoon. Excavate fill from behind East Barton Beach and revegetate/irrigate areas at grade.	0.5
Restored Dunes. Excavate new dune swales, place fill and salvaged vegetation, recontour new dune ridges, and revegetate/irrigate areas at grade.	0.5
Pilot Channel. Remove any protective soil plug or other temporary BMPs in the pilot channel. Pump water into pilot channel to pre-wet channel margins. Implement diversion to allow construction of the tie-in location between the pilot channel and the existing channel as well as the vertical and lateral grade controls at RS 32+00 on the existing channel.	2
Vertical and Lateral Grade Controls. Construct the lateral and vertical grade controls at RS 32+00 at the intersection of the new low-flow pilot channel with the backfilled existing channel to be abandoned, and the lateral grade control near RS 95+50 by the Sailing Lagoon overflow connection, Trout Creek confluence, and relocated Upper Truckee River low-flow alignment.	1

Table 2-5	
Sequence and Duration of Activities for Engineered Elements of the Preferred Alternative	
Activities/Engineered Element	Duration (months)
Partial Backfill and Complete Backfill of Old Channel. Place fill within the abandoned channel sections, contour to meet adjoining surfaces and simulate natural topography, revegetate, and irrigate.	2
Restored Lagoon. Recontour the east end of the Sailing Lagoon to reconnect the lagoon to the river, in association with construction of vertical and lateral grade controls and backfilling of the old channel.	1
Restored Floodplain. Recontour the former TKPOA Corporation Yard to match adjoining floodplain elevations and simulate natural topography, revegetate, and irrigate.	1
Stormwater Treatment Basins. Construct stormwater treatment facilities at RS 45+00 and RS 63+00.	1
Revegetation/Irrigation. Conduct permanent revegetation and install temporary irrigation at final grade as soon as feasible in all work areas.	1
Winterization. Install BMPs on all disturbed areas, “demobilize” all equipment from the site, remove or stabilize all access roads, and shut down the irrigation system.	0.5
YEAR 4 ACTIVITIES	
Mobilization. Inspect and/or rebuild haul road and staging areas as needed for the final year of work. Reinstall BMPs as needed and start up the irrigation system.	1
Revegetation/Irrigation. Inspect to evaluate the condition of all prior grading, revegetation, and BMPs. Initiate irrigation as soon as possible and inspect revegetation monthly. Reinstall BMPs as needed.	5
Winterization and Project Shutdown. Remove all construction-related BMPs and restore all disturbed areas, “demobilize” all construction equipment and related facilities from the site, remove and stabilize all access roads, and shut down the irrigation system. No additional work is planned by the contractor, except for maintenance during the warranty period.	0.5
Notes: BMP = best management practice; LWS = Lower West Side; RS = River Station; TKPOA = Tahoe Keys Property Owners Association; Source: Data compiled by Cardno in 2015	

Work related to the modification of the Sailing Lagoon and dune restoration would occur during Year 2. The lagoon would be isolated from the Tahoe Keys Marina by installing the bulkhead and levee along and east of the Tahoe Keys Marina channel and performing some of the water quality protections and invasive organism controls. The isolated lagoon would be drained, recontoured, and revegetated. Recontouring of the Sailing Lagoon would entail excavating sediment, some of which may be hauled off-site to an out-of-basin storage if not suitable for reuse in the dune reconstruction and/or channel backfill. The Sailing Lagoon modification activities could take as long as 4 months to complete.

YEAR 3

Construction of project features would be completed during Year 3, along with continued inspection and irrigation of revegetation treatments installed in Years 1 and 2. Lagoon and dune restoration would be completed in Year 3. The eastern end of the Sailing Lagoon would be recontoured, and the lagoon would be connected to the river. Fill would be removed behind East Barton Beach to restore and revegetate lagoon habitat.

Excavation and grading of the pilot channel connection and confluence and installation of the vertical and lateral grade controls in the main channel would be completed. Water would be pumped into finished channel segments and directed onto the existing vegetated Marsh surfaces. Fill would be placed in the abandoned channel sections and be recontoured; the modified stormwater treatment areas would be constructed. Permanent revegetation and temporary irrigation would be installed in all work areas at final grade.

Public-access and recreation infrastructure would be constructed during Year 3, including construction of trails, the observation area, viewpoint, kiosk, and the ADA-accessible fishing platform.

YEAR 4

Construction activities in Year 4 would be limited to revegetation and irrigation inspection and maintenance, and project shutdown.

2.5 ENVIRONMENTAL COMMITMENTS

Table 2-6 describes the proposed project’s Environmental Commitments (ECs), which are standard project components necessary to comply with existing federal statutes, state statutes, executive orders, and regulations. These environmental protection features are typical elements of permits and agency approvals, and therefore they were considered and applied as essential components of the project in the Draft EIR/EIS/EIS. The ECs were incorporated into the proposed project and considered before the application of thresholds of significance and determination of environmental impacts. These ECs assisted the Conservancy, Reclamation, and TRPA in determining the scope of the Draft EIR/EIS/EIS, developing program components and objectives, identifying the range of alternatives, defining potential environmental impacts and the significance of those impacts, and identifying appropriate mitigation measures.

In some instances, these ECs are insufficient to fully avoid potential impacts; therefore, mitigation measures are proposed when feasible. Mitigation measures are tied to a specific alternative action that either required more detail than standard regulatory requirements to make a conclusion, or went beyond those standard practices. Additional details on the proposed project’s compliance with applicable federal, state, and regional statutes and regulations and provisions can be found in Chapter 5, “Compliance, Consultation, and Coordination,” of the Draft EIR/EIS/EIS and the regulatory setting section of each resource area evaluated in the Draft EIR/EIS/EIS.

Table 2-6 Environmental Commitments of the Upper Truckee River and Marsh Restoration Project	
Environmental Commitment 1: Construction-Related Emissions of ROG, NO_x, and PM₁₀. TRPA and the El Dorado Air Quality Management District regulate construction-related emissions of ROG, NO _x , and PM ₁₀ . The project includes:	
▶	TRPA permits and approvals, requiring compliance with TRPA codes and procedures with respect to BMPs (TRPA Code Section 60.4), project grading (TRPA Code Section 33.3), excavation, and construction-related emissions-generating activities (TRPA Code Section 65.1, “Air Quality Control”).
▶	El Dorado County permits and approvals, requiring compliance with county laws and procedures with respect to BMPs, project grading excavation, and construction-related emissions-generating activities. The Conservancy and their construction contractor will comply with EDCAQMD Rule 202, Visible Emissions; Rule 205, Nuisance; Rule 223, Fugitive Dust–General Requirements; and Rule 223-1, Fugitive Dust–Construction, Bulk Material Handling, Blasting, Other Earthmoving Activities, and Carryout and Trackout Prevention. In addition, the contractor will implement the following fugitive dust control measures: <ul style="list-style-type: none"> • Apply dust suppression measures in a sufficient quantity and frequency to maintain a stabilized surface and prevent visible dust emissions from exceeding 100 feet in length in any direction. Apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust. • Install control measures immediately adjacent to the paved surface to prevent track-out from exiting vehicles.
▶	Restriction on activities disturbing the soil to between October 15 and May 1 of each year, unless approval has been granted by TRPA and the Lahontan RWQCB. All construction sites must be winterized before October 15 of each

Table 2-6
Environmental Commitments of the Upper Truckee River and Marsh Restoration Project

construction year in accordance with the provisions of Section 33.3.1.D of the TRPA Code of Ordinances and the National Pollutant Discharge Elimination System (NPDES) permit.

- ▶ Requirements for dust control measures for any grading activity creating substantial quantities of dust. Dust control measures must be approved by TRPA before groundbreaking and will comply with the provisions of Section 33.3.3 of the TRPA Code of Ordinances.

Environmental Commitment 2: Prepare and Implement a Cultural Resources Protection Plan. The U.S. Army Corps of Engineers and TRPA require protection of historic and cultural resources per Section 106 of the National Historic Preservation Act (NHPA) and TRPA ordinances (TRPA Code Section 29.2 and Section 64.8). The Project includes a cultural resource protection plan that will be prepared and implemented before and during construction. Measures will include, but are not limited to assuring final design placement and orientation of recreation infrastructure will incorporate visual screening or barriers as appropriate to minimize visibility and access which could otherwise lead to damage or destruction of prehistoric site CA-Eld-26; installing barriers or fencing during construction to protect identified sites, including CA-Eld-26; jobsite education on protocol to identify potential uncovered resources and response (stop work) protocol; and presence of a qualified cultural resource specialist to oversee grading activities that are in the vicinity of eligible resources, including initial grading activities within the vicinity of the bluff and CA-Eld-26. The Conservancy will ensure that the requirements of NHPA Section 106 are incorporated into the cultural resources protection plan. Before project-related ground disturbance begins, the Conservancy will train all construction personnel regarding the possibility of uncovering buried cultural resources. The Conservancy will retain a qualified cultural resources specialist to educate personnel as to how to identify prehistoric and historic-era archaeological remains. If unusual amounts of stone, bone, or shell or significant quantities of historic-era artifacts such as glass, ceramic, metal, or building remains are uncovered during construction activities, work in the vicinity of the specific construction site at which the suspected resources have been uncovered will be suspended, and the Conservancy will be contacted immediately. In addition, Reclamation or other federal lead agency for projects that require federal discretionary actions under NEPA will be contacted immediately so that the Section 106 Post-Review Discovery process, which includes consultation with the State Historic Preservation Officer (SHPO) and Indian tribes, proceeds as required by federal regulation (36 CFR 800.13). At that time, the Conservancy will retain a qualified professional archaeologist, who will conduct a field investigation of the specific site and recommend measures deemed necessary to protect or recover any cultural resources concluded by the archaeologist to represent significant or potentially significant resources as defined by CEQA, NEPA, and TRPA. These measures may include but will not necessarily be limited to avoidance, archival research, subsurface testing, and excavation of contiguous block units. The Conservancy will implement the measures deemed necessary by the archaeologist before construction resumes within the area of the find. The purpose of this oversight will be to ensure that cultural resources potentially uncovered during ground-disturbing activities are identified, evaluated for significance, and treated in accordance with their possible (NRHP) and California Register of Historical Resources (CRHR) status. Potential treatment methods for significant and potentially significant resources may include but will not be limited to taking no action (i.e., resources determined not to be significant), avoiding the resource by changing construction methods or project design, and implementing a program of testing and data recovery, in accordance with all applicable federal and state requirements.

Environmental Commitment 3: Stop Work Within an Appropriate Radius Around the Discovered Human Remains, Notify the El Dorado County Coroner and the Most Likely Descendants, and Treat Remains in Accordance With State and Federal Law. In accordance with Section 7050.5(b) of the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the contractor and/or the Conservancy will immediately halt potentially damaging excavation in the area of the burial and notify the El Dorado County Coroner and a professional archaeologist to determine the nature of the remains. In addition, Reclamation or other federal lead agencies that require federal discretionary actions under NEPA will be contacted immediately so that the Section 106 Post-Review Discovery process proceeds as required by federal regulation (36 CFR 800.13). The coroner will examine all discoveries of human remains within 48 hours of receiving notice of the discovery. If the coroner determines that the remains are those of a Native American, he or she will contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (California Health and Safety Code, Section 7050[c]). Following the coroner’s findings, the Conservancy, an archaeologist, and the NAHC-designated Most Likely Descendant (MLD) will determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting upon notification of a discovery of Native American human remains are identified in California Public Resources Code (PRC) Section 5097.9 Notification of and consultation with appropriate parties as identified through the Section 106 process would also be required if the project has federal funding or a federal permitting requirement.

Upon the discovery of Native American remains, the Conservancy will ensure that the immediate vicinity (according to

**Table 2-6
Environmental Commitments of the Upper Truckee River and Marsh Restoration Project**

generally accepted cultural or archaeological standards and practices) is not damaged or disturbed by further development activity until consultation with the MLD has taken place. The MLD will have 48 hours after being granted access to the site to complete a site inspection and make recommendations. A range of possible treatments for the remains, including nondestructive removal and analysis, preservation in place, relinquishment of the remains and associated items to the descendants, or other culturally appropriate treatment may be discussed. PRC Section 5097.9 suggests that the concerned parties may extend discussions beyond the initial 48 hours to allow for the discovery of additional remains. The following are site protection measures that the Conservancy will employ:

- ▶ Record the site with the NAHC or the appropriate Information Center of the California Historical Resources Information System.
- ▶ Utilize an open-space or conservation zoning designation or easement.
- ▶ Record a document with El Dorado County.

The Conservancy or its authorized representative will rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance if the NAHC is unable to identify a MLD or if the MLD fails to make a recommendation within 48 hours after being granted access to the site. The Conservancy or its authorized representative may also reinter the remains in a location not subject to further disturbance if it rejects the recommendation of the MLD and mediation by the NAHC fails to provide measures acceptable to the Conservancy.

Environmental Commitment 4: Prepare and Implement an Invasive Species Management Plan. TRPA and the California Department of Fish and Wildlife (CDFW) require invasive species management to address existing and potential terrestrial and aquatic invasive species. In addition, Reclamation or other federal lead agencies that require federal discretionary actions under NEPA will comply with Executive Order 13112, which directs all federal agencies to prevent the introduction and control the spread of invasive nonnative species in an environmentally sound manner to minimize ecological impacts. The project includes an Invasive Species Management Plan that will specifically address Eurasian watermilfoil as it is known to be present in the study area and is a species of particular concern. The plan will be divided into two sections: one addressing terrestrial species and the other addressing aquatic. The aquatic portion will be consistent with the State of California’s Aquatic Species Management Plan (CDFW 2008), and will be completed, reviewed, and approved by CDFW prior to initiation of construction. The plan will address how the project will address invasive species currently in the project area in addition to how the project will prevent introducing new species.

The plan will include the following measures to address both invasive aquatic and terrestrial species:

- ▶ A qualified biologist with experience in the Tahoe Basin will conduct a preconstruction survey to assess current populations of invasive plants in the project area. Invasive species presence will be documented, and an action plan in the context of the project will be developed to remove them prior to construction and/or prevent their spread due to construction activities. Control measures may include hand removal or other mechanical control. Herbicides are not allowed within Stream Environment Zones (SEZs).
- ▶ All equipment entering the study area from areas infested by invasive plants or areas of unknown infestation status will be cleaned of all attached soil or plant parts before being allowed into the study area. All motorized and nonmotorized equipment used for in-channel work will be thoroughly cleaned prior to use on the project site and then be cleaned before leaving the site. This includes waders, nets, seines, water quality monitoring equipment, boats, kayaks, life jackets, and construction vehicles.
- ▶ To restrict the import of seed or other materials potentially containing invasive plants, the project will use on-site or native sources of seed and materials to the extent practicable. Seed, soil amendment, and erosion control materials that need to be imported to the study area will be certified weed-free or will be obtained from a site documented as uninfested by invasive plants.
- ▶ With regard to aquatic invasive species, habitat within construction sites with aquatic invasive species will be isolated prior to in-channel work. A qualified biologist(s) with expertise in Tahoe Basin aquatic plant and animal species will be present during construction and will supervise the removal and disposal of nonnative invasive species from the project area. All biologists working on this program will be qualified to conduct nonnative aquatic species removal/disposal in a manner that avoids and/or minimizes all potential risks to native aquatic species, particularly any special status species potentially encountered. Biologists will be on site when work sites are isolated and/or dewatered, if necessary, in order to capture, handle, and safely remove or dispose of any nonnative aquatic invasive species encountered. This program will be closely coordinated with the Aquatic Species Rescue and Relocation Program, described below as Environmental Commitment 7.

**Table 2-6
Environmental Commitments of the Upper Truckee River and Marsh Restoration Project**

After project construction, the project site will be annually monitored for occurrence of invasive plants for four years. If invasive species are documented during monitoring, they will be treated and eradicated to prevent further spread.

Environmental Commitment 5: Prepare and Implement Effective Construction Site Management Plans. Several agencies (e.g., TRPA, the Lahontan RWQCB, the U.S. Army Corps of Engineers [USACE], CDFW, U.S. Fish and Wildlife Service [USFWS], and CSLT) regulate construction risks to water quality and vegetation degradation. The project includes several site management plans to comply with these existing regulations, including but not limited to a grading and erosion control plan, a dewatering and channel seasoning plan, a diversion plan, a winterization plan, and a monitoring and construction management plan. The plans require design features that:

- ▶ Restrict the area and duration of construction disturbance to the absolute minimum necessary to accomplish work. Protect existing vegetation outside construction area and salvage and reuse riparian vegetation where it needs to be disturbed.
- ▶ Design, install, and maintain temporary BMPs to protect disturbed areas and minimize soil erosion, prevent surface runoff interaction with disturbed surfaces, and limit the potential for release of sediment to surface water bodies for storm events up to the 20-year precipitation event.
- ▶ Design, install, and maintain internally draining construction area(s) within the study area to prevent discharge of untreated stormwater into surface water bodies. Anticipate runoff from adjacent lands and reroute it around the construction zone.
- ▶ Salvage topsoil to be reused on-site during project-related grading.
- ▶ Provide winterization that isolates and protects disturbed areas from high streamflow on the Upper Truckee River and Trout Creek (up to the 50-year event).
- ▶ Secure a source of transportation and a location for deposition and/or storage of all excavated and imported materials at the project site and minimize use of nonlocal materials and importation of materials from off-site.
- ▶ Protect stockpiled and transported materials or debris from wind or water erosion. Store soil and other loose material at least 100 feet from the active channel during the construction season. Designate staging areas and haul routes in existing developed or disturbed areas where feasible, and where not feasible, in the least sensitive natural areas feasible.
- ▶ Flag and/or fence boundaries of staging areas, haul routes, and construction sites.
- ▶ Restrict the placement of materials or equipment to designated staging areas or construction sites and prohibit the use of vehicles off of roads and haul routes.
- ▶ Minimize overwinter storage of materials, vehicles, equipment, or debris within the 100-year floodplain.
- ▶ Provide site-specific and reachwide dewatering/diversion plans that indicate the scheduling approach and/or maximum diverted flows to minimize risks from summer thunderstorms, specific diversion/bypass/ dewatering methods and equipment, defined work areas and diversion locations, the types and locations of temporary BMPs for the diversions and reintroduction points, measures and options for treating turbid water before release back to the channel, and stated water quality performance standards.
- ▶ Salvage and reuse plant materials to the extent practicable.
- ▶ Avoid fertilizer application to revegetated areas.
- ▶ Provide flushing flows before activation of new and reconnected river channel sections based on a “channel seasoning” plan that indicates the water source(s); volumes and duration required; phased placement of clean, washed gravels; and the measures and options for treating potentially turbid water.
- ▶ Require all contractors to develop Spill Prevention Plans (SPPs) and Storm Water Pollution Prevention Plans (SWPPPs). These plans will contain BMPs to be implemented to minimize the risk of sedimentation, turbidity, and hazardous material spills. Applicable BMPs may include permanent and temporary erosion control measures, including the use of straw bales, mulch or wattles, silt fences, filter fabric, spill remediation material such as absorbent booms, proper staging of fuel, out of channel equipment maintenance, and ultimately seeding and revegetating. Preventing contaminants from entering the river during construction and operation of the project will protect water quality and the aquatic habitat.
- ▶ Maintain the effectiveness of temporary erosion control, stormwater facilities, and flood flow protections throughout the construction area. Monitor the status and effectiveness of temporary erosion control, stormwater facilities, and flood flow protections throughout the construction area, including each of the internally draining zones that could separately discharge to various surface water bodies. Monitor turbidity upstream of the Upper Truckee River and Trout Creek, and where feasible, downstream of the construction zone. Monitoring will be conducted by qualified personnel on a regular

**Table 2-6
Environmental Commitments of the Upper Truckee River and Marsh Restoration Project**

basis during summer construction and on an event basis when runoff equals or exceeds the BMP design standards. Document failures and/or threats of BMP failures, and identify remedial measures implementation. Repair BMP failures within 24 hours of documentation.

Environmental Commitment 6: Obtain and Comply with Federal, State, Regional, and Local Permits. Federal, state, and local permits, as described in the other ECs in this table, require that the project include various environmental protection features. The project includes all necessary permits and the standard requirements to comply with the permits, as described more specifically in the other ECs in this table. The anticipated compliance, consultation, and coordination are described further in Chapter 5 of the Draft EIR/EIS/EIS.

Environmental Commitment 7: Prepare and Implement an Aquatic Species Rescue and Relocation Plan. TRPA Code Section 79, "Fish Resources," and CDFW regulations protect aquatic organisms from construction-related effects. The project includes an Aquatic Species Rescue and Relocation Plan that will protect native fish or desired sport (trout) and native mussels from impacts associated with construction of the project. The objective of the rescue and relocation effort is to reduce harm and avoid potential mortality of important aquatic species, especially sensitive fish species and mussels, which may be present within the project area. The plan will be completed, reviewed, and approved by both CDFW and USFWS (for Lahontan cutthroat trout) prior to initiation of construction.

Aquatic habitat within work areas will be isolated (using block nets, silt curtains, or coffer dams) prior to in-channel work. A qualified biologist with expertise in Tahoe Basin aquatic species, including the collection, handling, and relocating of fish and freshwater mussels, habitat relationships, and biological monitoring of Tahoe Basin fish species will supervise the fish and mussel rescue and relocation program for the project. All biologists working on the fish rescue and recovery program will be qualified to conduct fish and mussel collections in a manner that minimizes all potential risks to collected animals, particularly any special status species potentially encountered.

Aquatic organisms isolated within the work area(s) will be removed by hand, seine netting, or, if necessary, electrofishing. Partial dewatering of the site will facilitate removal of aquatic species, but dewatering should not expose or strand individuals to be rescued, and water temperature and dissolved oxygen levels should be monitored to maintain levels supporting the most sensitive species. Should western pearlshell mussels be found in the site, the mussels shall be removed prior to fish rescues to minimize injury from foot traffic or electrofishing. Mussels can be located and removed by hand in wadeable streams; snorkeling and hand removal may be needed in deeper water. If electrofishing is necessary, it will be performed by qualified biologists and conducted according to established guidelines provided by CDFW and USFWS. Biologists will be on site when work sites are isolated and/or dewatered, in order to capture, handle, and safely relocate sensitive fish species (i.e., Lahontan cutthroat trout and western pearlshell mussels). Appropriate rescue methods should consider both general (low conductive water) and site-specific conditions (substrate, bed morphology).

All captured native fish and mussels will be relocated, as soon as possible, to another Upper Truckee River site that has been preapproved by CDFW and USFWS and/or USFS biologists, and in which suitable habitat conditions are present.

All captured invasive species encountered (e.g., bluegill, bass, and catfish) or aquatic invasive plants will be disposed of, consistent with the approved Environmental Commitment 4, "Prepare and Implement an Invasive Species Management Plan," described above.

Environmental Commitment 8: Prepare a Final Geotechnical Engineering Report. TRPA requires preparation of grading plans which are will be developed based on the geotechnical report information to support project designs and construction activities. Section 33.3, "Grading Standards," of the TRPA Code of Ordinances regulates excavation, filling, and clearing to avoid adverse effects related to exposed soils, unstable earthworks, or groundwater interference. Section 33.3 specifically addresses seasonal limitations, winterization techniques, discharge prohibitions, dust control, disposal of materials, standards for cuts and fills, and excavation limitations. Section 33.4, "Special Information Reports and Plans," regulates the need for special investigations, reports, and plans determined to be necessary by TRPA to protect against adverse effects from grading, including potential effects on slope stability, groundwater or antiquities. The project includes a final geotechnical engineering report for the project that will address and make recommendations on the following as necessary:

- ▶ site preparation;
- ▶ appropriate sources and types of fill;
- ▶ potential need for soil amendments;
- ▶ access roads, pavement, and asphalt areas;
- ▶ shallow groundwater table; and
- ▶ soil and slope stability.

**Table 2-6
Environmental Commitments of the Upper Truckee River and Marsh Restoration Project**

In addition to the recommendations for the conditions listed above, the geotechnical investigation will include subsurface testing of soil and groundwater conditions for proposed project elements and will determine appropriate bulkhead and levee and bridge foundation designs that are consistent with CSLT code requirements. The shorezone is regulated by the TRPA Code, Chapters 54 and 55. As a result, all projects which fall within this area are referred to the TRPA for review. The CSLT review will be limited to providing input into the TRPA process and processing the project through the city permit process. (Ord. 903. Code 1997 § 5-29) As described in section 7.20.070 Exemptions of the CSLT Code unless in conflict with provisions of adopted general and/or specific plans, stream restoration or alteration projects conducted under valid regional, state or federal permits, e.g., stream alteration permits, water quality certifications, etc. may be done without obtaining a CSLT grading permit. Exemption from the requirement of a grading permit shall not be construed as permission to violate any provision of code requirements (Ord. 1000 § 1. Code 1997 § 36-7). All recommendations contained in the final geotechnical engineering report will be implemented by the Conservancy. Special recommendations contained in the geotechnical engineering report will be noted on the grading plans and implemented as appropriate before construction begins. Design and construction of all phases of the project will be in accordance with current CSLT code requirements at the time of construction.

Environmental Commitment 9: Develop and Implement a Construction Management Program. The project includes a construction management program that will inform contractors and subcontractors of:

- ▶ work hours,
- ▶ modes and locations of transportation and parking for construction workers,
- ▶ location of overhead and underground utilities,
- ▶ worker health and safety,
- ▶ truck routes,
- ▶ stockpiling and staging procedures,
- ▶ public access routes,
- ▶ the terms and conditions of all project permits and approvals, and
- ▶ the health and safety plan (HASP) information described below.

The project includes a HASP, which will be complied with throughout project implementation because construction personnel shall be made familiar with the contents of the plan before the start of construction activities. A copy of the plan shall be posted in the trailer used by the on-site construction superintendent. The HASP:

- ▶ clearly notifies all workers of the potential to encounter hazardous materials during demolition and construction activities;
- ▶ identifies proper handling and disposal procedures for contaminants expected to be on-site as well as maps and phone numbers for local hospitals and other emergency contacts;
- ▶ requires that stored hazardous materials present in the study area be removed and disposed at appropriately permitted locations, as appropriate;
- ▶ describes fire prevention and response methods, including fire precaution, prevention, and suppression methods that are consistent with the policies and standards in South Lake Tahoe;
- ▶ includes a requirement that all construction equipment be equipped with spark arrestors; and
- ▶ includes construction notification procedures for CSLT police, public works, and fire department and schools within one-quarter mile before construction activities.

As required by California Public Resources Code Section 21151.4, the Conservancy shall provide written notification of the project to the Lake Tahoe Unified School District at least 30 days before certification of the EIR/EIS/EIS and shall consult with the school district regarding proper handling and disposal methods associated with substances subject to California Health and Safety Code Section 25532. Notices would also be distributed to neighboring property owners, local agencies, and public works, police, and fire departments, and the Lake Tahoe Unified School District.

Environmental Commitment 10: Establish and Implement a Management Agreement with the El Dorado County Vector Control District. The project includes a management agreement with the El Dorado County Vector Control District (EDCVCD) to adequately control mosquito populations in the study area. As a performance criterion for the management agreement, the terms and conditions of the agreement will be designed to ensure that EDCVCD can maintain mosquito abundance at or below preproject levels. The agreement will include, but not be limited to, the following:

**Table 2-6
Environmental Commitments of the Upper Truckee River and Marsh Restoration Project**

- ▶ measures that ensure necessary access for monitoring and control measures;
- ▶ EDCVCD review of project plans and provision of recommendations for management of mosquito populations; and
- ▶ applicable best management practices from the California Department of Public Health’s *Best Management Practices for Mosquito Control on California State Properties* (CDPH 2012), including
 - procedures for coordinating Conservancy and EDCVCD management activities, and
 - providing public information for visitors and the community regarding control measures being implemented, the risk of transmission of mosquito-borne disease, and personal protective measures.

Environmental Commitment 11: Incorporate Effective Permanent Stormwater Best Management Practices. TRPA (TRPA Code Section 25, “Best Management Practices Requirements”) and Lahontan RWQCB regulations (Clean Water Act Section 402) require that the final design of all recreation features with impervious or partially pervious surfaces will incorporate effective permanent BMPs for the protection of water quality. The project includes design features that will conform to applicable ordinances and standard conditions established by TRPA and the Lahontan RWQCB. At a minimum, the stormwater design will:

- ▶ minimize the area of disturbance and coverage for all permanent features;
- ▶ maximize the use of porous media (e.g., porous pavement, decomposed granite fill) for trail surfaces;
- ▶ optimize trail slopes for proper drainage;
- ▶ provide for at-the-source infiltration of roof or other cover runoff; and
- ▶ provide for collection of runoff from impervious pavements and direct the runoff through oil/water separator(s) and advance treatment prior to discharge to Stream Environment Zones (SEZs).

Environmental Commitment 12: Prepare and Implement Traffic Control Plans. To ensure consistency with CSLT Code 26-16 and state safety orders, rules, and regulations of the Division of Industrial Safety including §1598. Traffic Control for Public Streets and Highways, the project includes traffic control plans for construction activities that may encroach on CSLT and California State road rights-of-way. The traffic control plans will follow California Department of Transportation’s (Caltrans) Standard Plans, Standard Special Provisions, and Non-Standard Special Provisions for Temporary Traffic Control Systems and will be signed by a professional engineer. Measures typically used in traffic control plans include advertising of planned lane closures, warning signage, a flag person to direct traffic flows when needed, and methods to ensure continued access by emergency vehicles. During project construction, access to existing land uses will be maintained at all times, with detours used as necessary during road closures. Traffic control plans will be submitted to the CSLT Public Works Department for review and approval before construction of project phases whose implementation may cause encroachment on CSLT or California State road rights-of-way. The Traffic Control Plan will address safety conflicts between construction traffic and of local traffic, pedestrians, and bicyclists. The plan will include advance public advisories, construction-period signage, flag personnel, and other special traffic-control actions as necessary. Specific measures contained in the plan include the following.

- ▶ Distribute or mail flyers to residents in the nearby Al Tahoe, Highlands Woods, and Tahoe Keys subdivisions advising about upcoming project traffic prior to the initiation of construction.
- ▶ Place advisory signs along construction routes in advance of construction to alert traffic, pedestrian, and bicyclists about the upcoming construction traffic activity.
- ▶ Install construction area signage on designated haul routes to inform the public of the presence of trucks.
- ▶ Provide flag personnel when truck activity is heavy (i.e., more than ten trucks per hour).
- ▶ Provide information to all truck drivers identifying haul routes, speed limits, location of flaggers, and any other pertinent public safety information.
- ▶ Monitor truck and traffic conditions to identify traffic congestion, safety concerns regarding truck, vehicle, and pedestrian and bicycle conflicts and adjust management approach as needed.

Environmental Commitment 13: Prepare and Implement a Public Outreach Plan. The project includes a Public Outreach Plan (POP) to inform the general public and partnering agencies, such as the CSLT, El Dorado County Vector Control, and El Dorado County Animal Control, of construction-related activities within the Project Area. Further, in consultation with the construction contractor, every effort will be made to maintain access to and within the Study Area, including trail access to Lake Tahoe, insofar as the public’s health and safety can be assured. There may be periods of time when it is deemed unsafe for the public to be within the study area and/or on trails to the lake during certain construction

**Table 2-6
Environmental Commitments of the Upper Truckee River and Marsh Restoration Project**

activities. These periods of restricted access are alternative and construction season dependent. The POP will include strategies to inform the general public and partnering agencies of access restrictions and their anticipated timelines, alternate locations for passive recreation activities, and site access information. Communication of this information may be through signage at access points, messages posted to the Conservancy website, and Public Service Announcements and news articles in the local and regional newspapers, online and in print.

Environmental Commitment 14: Prepare and Implement a Waterway Traffic Control Plan for Alternatives That Affect the Sailing Lagoon and/or all accessible reaches of the Upper Truckee River within the Upper Truckee River and Marsh Restoration Project Area. The project includes a waterway traffic control plan to ensure safe and efficient vessel navigation during construction at the junction of the Sailing Lagoon and the adjacent channel of the Tahoe Keys Marina and within all accessible reaches of the Upper Truckee River within the project area. The plan will include vessel (motorized and unmotorized) traffic control measures to minimize congestion and navigation hazards. Construction areas in the waterway will be barricaded or guarded by readily visible barriers, or other effective means to warn boaters of their presence and restrict access. Warning devices and signage will be consistent with the California Uniform State Marking System and effective during nondaylight hours and periods of dense fog.

The Conservancy will maintain safe boat access to public launch and docking facilities, businesses, and residences of the Tahoe Keys Marina and will minimize the partial closure of the waterway. Where temporary channel closure is necessary, a temporary channel closure plan shall be developed. The waterway closure plan shall include procedures for notification of the temporary closure to the United States Coast Guard, boating organizations, Tahoe Keys Marina, boat/kayak rental businesses within the area, and all other effective means of notifying boaters.

Notes: BMP = best management practice; CEQA = California Environmental Quality Act; Conservancy = California Tahoe Conservancy; NEPA = National Environmental Policy Act; NOX = oxides of nitrogen; PM10 = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; RWQCB = Regional Water Quality Control Board; TRPA = Tahoe Regional Planning Agency
Source: Data compiled by AECOM in 2013