

Environmental Assessment Lower Truckee River Restoration Projects at Lockwood, Mustang Ranch, and 102 Ranch

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Environmental Assessment Lower Truckee River Restoration Projects

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Acronyms and Abbreviations

AQMD	Air Quality Management Division	NDWR	Nevada Division of Water Resources
BAPC	Bureau of Air Pollution Control	NEPA	National Environmental Policy Act
BAQP	Bureau of Air Quality Planning	NHPA	National Historic Preservation Act
BLM	U.S. Bureau of Land Management	NSR	North State Resources, Inc.
BMPs	Best Management Practices	NO _x	nitrogen oxides
CAA	Clean Air Act	NO ₂	nitrogen dioxide
CDFG	California Department of Fish and Game	NPDES	National Pollutant Discharge Elimination System
CEQ	Council on Environmental Quality	O ₃	ozone
CFR	Code of Federal Regulations	OS	Open Space
cfs	cubic feet per second	PA	Programmatic Agreement
CMA	Cooperative Management Agreement	Pb	lead
CO	carbon monoxide	PLPT	Pyramid Lake Paiute Tribe
CO ₂	carbon dioxide	PM _{2.5}	particulate matter less than or equal to 2.5 microns in diameter
Colony	Reno-Sparks Indian Colony		
DM	Department of the Interior Department Manual	PM ₁₀	particulate matter less than or equal to 10 microns in diameter
DO	dissolved oxygen	Reclamation	U.S. Bureau of Reclamation
DTL	Desert Terminal Lakes Program	ROG	reactive organic gases
EA	environmental assessment	Secretary	Secretary of the Interior
EPA	Environmental Protection Agency	SHPO	State Historic Preservation Office
EIS	environmental impact statement	SWPPP	State Water Pollution Prevention Plan
ESA	Endangered Species Act	SO ₂	sulfur dioxide
°F	Fahrenheit	SO _x	sulfides
FEMA	Federal Emergency Management Agency	TDS	total dissolved solids
FONSI	Finding of No Significant Impact	TMDL	Total Maximum Daily Load
GC	General Commercial	TMRPA	Truckee Meadows Regional Planning Agency
GR	General Rule	TMSA	Truckee Meadows Service Area
I-80	Interstate 80	TMWRF	Truckee Meadows Wastewater Reclamation Facility
IBA	Important Bird Area	TNC	The Nature Conservancy
LCT	Lahontan cutthroat trout	TROA	Truckee River Operating Agreement
LDS	Low Density Suburban	TSS	total suspended solids
LDU	Low Density Urban	USACE	U.S. Army Corps of Engineers
MDBM	Mount Diablo Baseline and Meridian	USFWS	U.S. Fish and Wildlife Service
MOA	Memorandum of Agreement	USGS	U.S. Geological Service
NAAQS	National Ambient Air Quality Standards	Washoe	Washoe Tribe of Nevada and California
NDEP	Nevada Division of Environmental Protection	WQSA	Truckee River Water Quality Settlement Agreement

Summary

Introduction

The U.S. Bureau of Reclamation (Reclamation) and the U.S. Bureau of Land Management (BLM) have prepared this Environmental Assessment (EA) to evaluate the potential environmental consequences of implementing three river and ecological restoration projects on the lower Truckee River, located east of the cities of Reno and Sparks, south of Interstate 80, in Washoe County and Storey County, Nevada. The sites are identified as Lockwood, Mustang Ranch, and 102 Ranch. The Lockwood site is owned by Washoe County, the Mustang Ranch site is owned by BLM and The Nature Conservancy (TNC), and the 102 Ranch site is owned by BLM.

Background

Over the past century, the ecological and physical environment associated with the lower Truckee River has been degraded as a result of many human-caused changes, which have damaged the ecological integrity and functioning of the river. Included in this history is river channelization in the 1960s, which resulted in channel downcutting, depression of the local groundwater table, loss of riparian vegetation, proliferation of invasive plant species, and general degradation of the riparian and aquatic habitats.

Purpose and Need

The primary purpose of the three integrated projects is to help restore basic physical and biological functions to a more natural condition so that the ecological systems and native organisms can depend on those functions. The projects are intended to undo previous environmental degradation at the three sites and, thus, contribute to the restoration of the lower Truckee River and Pyramid Lake, the river's terminus. The purpose and need for restoration at these three sites is also related to providing flood flow attenuation, riverbank stabilization, public access, and recreation opportunities.

Proposed Action

The proposed restoration work at the three sites involves a variety of activities that would restore the physical river channel and riverbed and improve habitat for native vegetation, fish, and wildlife at Lockwood, Mustang Ranch, and 102 Ranch. The Proposed Action also includes a permanent transfer of 250 acre-feet of water rights annually from the cities of Reno and Sparks to Pyramid Lake for these and another restoration project located on the lower Truckee River below Derby Dam.

The use of federal land is proposed to be authorized for the activities identified in this EA. The terms of this authorization are documented in a draft Cooperative Management Agreement (CMA) between BLM and TNC. The Proposed Action also includes the granting of a flowage easement from BLM to the State of Nevada to allow the Truckee River to flow through and flood the public lands at Mustang Ranch and 102 Ranch, as well as a reciprocal easement from the State of Nevada to BLM to use and occupy land within the bed and banks of the river for restoration purposes. In addition, other terms of mutual agreement have been identified through consultations and meetings involving the agencies, TNC, the Pyramid Lake Paiute Tribe (PLPT), the Washoe Tribe of Nevada and California (Washoe

Tribe), and the Reno-Sparks Indian Colony (Colony), resulting in a Memorandum of Agreement (MOA), the approval of which is also part of this Proposed Action.

Construction work at the three sites will create more natural meandering stream channel segments and raise the streambed of the channel to reconnect the river to the floodplain. Wetlands will be constructed in the floodplain to provide floodwater attenuation and habitat. Rounded river rock will be used to create riffles in the river to facilitate gas exchange (i.e., improve oxygen content and decrease CO₂) for fish and other aquatic species. Invasive plant species will be significantly reduced, controlled, and largely replaced with native forbs, grasses, shrubs, and trees.

Riparian and upland areas will be revegetated with native plant species of value to wildlife, including special-status wildlife species. The proposed plant species will include native plant species of value to Native American traditional practitioners for traditional cultural uses, in cooperation with BLM cultural and biological specialists. Hillocks and other topographic features are proposed to improve cover, nesting, and shelter for wildlife.

The construction work at the Mustang Ranch site includes the relocation of a petroleum products pipeline. At the Lockwood site, the proposed work includes the removal of a former residential structure and utilities, as well as the installation of riverbank armoring upstream of the Lockwood Bridge to protect a roadway, structures, and other improvements.

Environmental Consequences of the Proposed Action and Alternative

Overall, the consequences of the Proposed Action would be beneficial for the environment, particularly in the long term, considering the projects both individually and cumulatively. The EA analyses, which are focused on air quality, hydrology and water quality, biological resources, special-status species, and cultural resources, found no significant environmental effects in any resource area. Short-term, temporary effects in terms of air quality, water quality, habitat changes, and noise are foreseeable during construction. Measures to reduce adverse effects are provided, as appropriate. These measures are summarized at the end of the EA in the form of environmental commitments.

Under the No-Action Alternative, the existing, somewhat limited fish and wildlife habitat values would continue to follow existing trends. Riverbank erosion and lateral instability would continue under the current hydrologic regime, and the river channel would likely become wider and shallower, possibly resulting in decreased willow and cottonwood densities and diminished native habitat that supports aquatic and terrestrial species. Groundwater recharge needed to support and sustain riparian and wetland habitats would remain at a lower level and could decline further. Active management to control invasive plant species would likely be much less intensive. Flood attenuation benefits would not be realized. The No-Action Alternative would avoid the short-term adverse effects associated with the proposed construction work at the restoration sites, thus avoiding the construction-related effects related to air and water quality, fish habitat, and temporary increases in noise. However, longer-term consequences of the No-Action Alternative would not be beneficial for the environment.

Purpose and Uses of This EA

This EA is a record of the federal lead agencies' environmental review for the Proposed Action. It discloses to the public, other agencies, and interested parties what the lead agencies are considering

approving and identifies the potential environmental consequences of that action as well as measures to avoid or reduce adverse environmental effects. The EA is used by the federal lead agencies to inform decisions regarding the Proposed Action and to determine whether the agencies should prepare an environmental impact statement (EIS) or issue a finding of no significant impact (FONSI).

Reclamation and BLM will each prepare findings regarding the environmental consequences of the Proposed Action, and those findings will be used in the agencies' decision making and implementation of the Proposed Action. Reclamation's primary involvement and decision making for the Proposed Action involves providing part of the funding for the restoration work. The decisions to be made by BLM include the consideration of whether the Proposed Action is consistent with the agency's applicable comprehensive land use plan. The Proposed Action has been reviewed for conformance with the BLM Carson City Field Office Consolidated Resource Management Plan (2001) and the Southern Washoe County Urban Interface Plan Amendment (2001). As the federal steward of public land, BLM must consider authorizing the Proposed Action in the context of balancing all public interests.

Both agencies must consider Indian trust assets and the local Native American interests in the Proposed Action, including, among other matters, the protection of cultural resources and the future use of the restored sites as places to harvest and manage native vegetation for traditional purposes. Coordination among the agencies, TNC, the PLPT, Washoe Tribe, and the Colony has occurred during the development of the restoration projects and is programmed to continue during implementation.

Section 1 Introduction

1.1 Location and Overview of the Proposed Action

The Nature Conservancy (TNC), in partnership with the Bureau of Reclamation (Reclamation), Bureau of Land Management (BLM), City of Reno, City of Sparks, and Washoe County, proposes to construct and implement river and ecological restoration projects at three sites along the lower Truckee River. The sites are identified as Lockwood, Mustang Ranch, and 102 Ranch; collectively, the three projects constitute the Lower Truckee River Restoration Project (Proposed Action) addressed in this environmental assessment (EA).

The Proposed Action area is located along the lower Truckee River, east of the cities of Reno and Sparks, and south of I-80, in Storey County and Washoe County, Nevada (Figure 1-1). The river is the approximate boundary between the counties. Specific locations and general descriptions of each of the three sites are provided below (further description of the existing conditions at the three sites is presented in Section 3.0).

1.1.1 Lockwood

The Lockwood site occurs in the Vista, Nevada 7.5-minute U.S. Geological Service (USGS) quadrangle, in Section 17, Township 19 North, Range 21 East, Section 17, Mount Diablo Baseline and Meridian (MDBM) (see Figure 1-2). The site was purchased by Washoe County using Federal Emergency Management Agency (FEMA) funds following the 1997 flood of what was formerly a mobile home park.

1.1.2 Mustang Ranch

The Mustang Ranch site occurs in the Patrick, Nevada 7.5-minute USGS quadrangle, in Sections 2, 10, 11, 14, 15, Township 19 North, Range 21 East, MDBM (see Figure 1-3). Formerly the location of the Mustang Ranch brothel, the Mustang Ranch property was seized by the U.S. Internal Revenue Service and closed in 1999. In February 2003, the U.S. Department of Treasury transferred title to all lands known as the Mustang Ranch properties to BLM. In March 2007, the final remaining building on the site was demolished and burned in a local fire department training exercise.

1.1.3 102 Ranch

The 102 Ranch site occurs in the Derby Dam/Patrick, Nevada 7.5-minute USGS quadrangle, in Sections 26, 27, 34, 35, Township 20 North, Range 22 East, MDBM (see Figure 1-4). The site was acquired by BLM in August 2006 using funds from the Southern Nevada Public Lands Management Act. The property contains over 1.25 miles of river frontage and has been identified by the lead agencies as an important piece of the river restoration project. No structures exist on the restoration site.

Figure 1-1. Regional Location Map

Figure 1-2. Lockwood Project Location Map

Figure 1-3. Mustang Ranch Project Location Map

Figure 1-4. 102 Ranch Project Location Map

The Proposed Action is described in detail in Section 3.0 and also in the Biological Assessment (BA) (NSR 2008) prepared for federal agency consultation purposes under the Endangered Species Act (16 U.S.C. 1531 et seq.) and the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.). Generally, the three river restoration projects will involve the creation of new areas of aquatic and terrestrial habitat, including river channel realignment and modifications, wetlands, and areas of native vegetation, for the purposes of restoring the degraded ecosystem to a more natural condition.

1.2 Purpose of this Document and Decisions to Be Made

Because portions of the restoration activities will occur on public land administered by federal agencies and because the project is supported in part by federal funds, the Proposed Action is subject to environmental review pursuant to the National Environmental Policy Act of 1969 (NEPA) (Public Law 91-90, 42 USC 4321 et seq.).

Reclamation and BLM are the joint lead agencies under NEPA for the Proposed Action. The U.S. Fish and Wildlife Service (USFWS) and Washoe County are cooperating agencies. Reclamation and BLM have prepared this EA in compliance with NEPA, Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500–1508) and related CEQ guidance, Department of the Interior Department Manual (DM) 516 DM 1-15, and Reclamation’s and BLM’s NEPA Handbooks.

This EA evaluates the potential environmental consequences of constructing and implementing the Proposed Action. It provides documentation to assist the lead agencies in determining whether to prepare an environmental impact statement (EIS) or a Finding of No Significant Impact (FONSI). The EA and FONSI (or, if appropriate, the EIS), in conjunction with the overall administrative record, serve as the record of NEPA compliance for the Proposed Action. The EA also serves NEPA’s fundamental purposes: to provide environmental information that informs federal decision making, to disclose the potential environmental consequences of a Proposed Action to the public, and to identify feasible ways to avoid and minimize adverse effects to the environment.

Reclamation and BLM will each prepare findings regarding the environmental consequences of the Proposed Action, and those findings will be used in the agencies’ decision making and implementation of the Proposed Action. Reclamation’s primary involvement and decision making for the Proposed Action involves providing part of the funding for the restoration work. The restoration projects proposed in this EA receive a portion of their funding from Reclamation’s Desert Terminal Lakes Program (DTLP) created under Public Law 101-171 in 2002. The law set aside \$200 million “to provide water to at-risk natural desert terminal lakes.” Additional legislation in 2003 specified that funding be used “only for the Pyramid, Summit, and Walker Lakes in the State of Nevada.” Truckee River DTLP authorizes activities to provide water to Pyramid Lake. The restoration projects include a transfer of 250 acre-feet of water rights from the cities of Reno and Sparks to Pyramid Lake for these and another lower Truckee River restoration project. An interdisciplinary committee recommended funding for restoration projects analyzed in this EA and another restoration project located on the lower Truckee River below Derby Dam.

The decisions to be made by BLM include the consideration of whether the Proposed Action is consistent with the agency’s applicable comprehensive land use plan. As the federal steward of public

land, BLM must consider authorizing the Proposed Action in the context of balancing all public interests. The primary instrument for authorizing this use and documenting the terms of this authorization is the Cooperative Management Agreement (CMA) between BLM and TNC (Appendix D). Among other matters, this agreement establishes the purposes and terms of cooperation, activities that TNC will perform, management actions that BLM will perform, and permits and authorizations both parties will obtain and hold. The Proposed Action has been reviewed for conformance with the BLM Carson City Field Office Consolidated Resource Management Plan (2001) and the Southern Washoe County Urban Interface Plan Amendment (2001). These plans directed BLM to acquire lands for resource protection, enhancing open space values and to facilitate access to public lands.

Both agencies must consider Indian trust assets and the tribal interests in the Proposed Action, including, but not limited to, the future use of the restored sites as places to use native vegetation for traditional and cultural purposes (see also Section 3.1.3). Future use of the restored sites as places to harvest and manage native vegetation for traditional purposes will be evaluated by BLM as projects are proposed. Items of mutual agreement have been identified through consultation and meetings involving the lead agencies, TNC, the Pyramid Lake Paiute Tribe (PLPT), the Washoe Tribe of Nevada and California (Washoe Tribe), and the Reno-Sparks Indian Colony (Colony), resulting in a Memorandum of Agreement (MOA) (Appendix E), the approval of which is also part of this Proposed Action.

1.3 Organization of this Document

The contents of this document follow NEPA, the CEQ NEPA Regulations, and the lead agencies' implementing regulations and guidance. Following this introduction, Section 2.0 presents background information and discusses the purpose and need for the Proposed Action, both overall and at the three sites individually. Section 3.0 provides a detailed description of the Proposed Action and explains the No-Action Alternative. Between Section 3.0 and Section 4.0 is a set of nine figures (Figures 3-1a, b, and c; Figures 3-2a, b, and c; and Figures 3-3a, b, and c) depicting the existing habitat conditions, the restoration construction activities, and the proposed future conditions at the Lockwood, Mustang Ranch, and 102 Ranch sites.

Section 4.0 describes the affected environment and the environmental consequences, focusing on resources and potential effects in proportion to their significance; accordingly, effects on some resources are assessed in greater detail than other resources. Section 5.0 is a summary of related consultation and coordination activities. Section 6.0 is a summary of compliance with environmental statutes.

Consistent with NEPA, and pursuant to Reclamation's NEPA Handbook, Section 7.0 of this EA provides a summary of the measures that have been identified, in addition to measures already incorporated in the Proposed Action, to reduce or avoid adverse environmental consequences. Section 8.0 provides a list of the persons responsible for preparing the document, and Section 9.0 provides a bibliography of documents reviewed and cited as references.

Section 2 Purpose and Need

An EA must contain a brief discussion explaining the need for the Proposed Action (40 CFR 1508.9(b)). This statement is intended to explain the underlying purpose and need to which the lead agency (or agencies) is responding. The statement of purpose and need is also used in the development of an appropriate range of alternatives. To provide context, the discussion below begins with some background information.

2.1 Background

Over the past century, the lower Truckee River downstream from Vista has suffered from many anthropogenic changes, which have significantly altered the ecological integrity and functioning of this reach of the river. Truckee River flows are regulated by a number of agreements, decrees, and river operating requirements extending as far back as the turn of the century.

Under the authority of the Flood Control Act of 1954, the U.S. Army Corps of Engineers (USACE) began major flood control work on the Truckee River in 1959, completing most of the work by 1963 (State of Nevada 1997). The Truckee River and Tributaries Project was initiated by the USACE to provide flood protection for the cities of Reno and Sparks. The USACE modified the Truckee River by constructing low levees and making channel modifications between Truckee Meadows and Pyramid Lake. The river channel was straightened and widened from 75 to 200 feet in many sections. The straightening led to channel downcutting of approximately 3 feet on average along the lower Truckee River and depression of the groundwater table. The lowered groundwater depth has disconnected the river from the riparian habitat and surrounding floodplains. Without access to groundwater, regeneration of native riparian vegetation has been significantly impaired for decades, and invasive species have begun to dominate the riparian communities along the river's edge.

Land use practices along the Truckee River have altered the flow regimes and caused the condition of riparian vegetation to decline, resulting in a significant reduction of critical habitat for birds, mammals, reptiles, and amphibians. Urban growth and development in the cities of Reno and Sparks have increased the amount of impervious surfaces, affecting water quality and the extent and timing of flooding.

During the past two years, TNC and its partner agencies have demonstrated river restoration techniques on the lower Truckee River through the 305-acre McCarran Ranch, located between the Lockwood site and the Mustang Ranch site (as shown in Figure 1-1). The restoration activities at McCarran Ranch included the creation of a new river meander; approximately 1 mile of new channel and riffle construction; revegetation of more than 20 riparian acres; creation of wetlands and ponds, including oxbow wetlands; and a variety of wildlife nesting, cover, and shelter improvements. The constructed riffles raise the water surface level and promote more frequent overbank flooding within the project areas. The localized overbank flooding of these uninhabited floodplain areas improves soil fertility and ecological productivity, while attenuating downstream flooding.

These river and riparian restoration measures are correcting the undesirable side effects of channelization and river entrenchment associated with past flood control efforts occurring in the 1960s, while retaining the benefits of flood flow attenuation. Restoration at the McCarran Ranch site is resulting in the recovery of the groundwater table in the project area, increased populations and survivorship of native plants, and increased fish and bird populations. The decreased channel width promotes improved hydraulic connection between the river channel and its floodplain to better support wetland habitat.

One of the more significant changes to this section of the river, construction of Derby Dam and the Newlands Project, occurred downstream of the proposed restoration sites discussed in this EA. The Reclamation Act of 1902 authorized the construction of the Newlands Project, a trans-basin diversion for agricultural development. The Newlands Project provides water for irrigation and wetlands purposes from the Truckee and Carson Rivers for approximately 57,000 acres in the Lahontan Valley near Fallon and Fernley in western Nevada. Water is diverted from the Truckee River into the Truckee Canal for the Truckee Division and conveyance to Lahontan Reservoir for storage for irrigation in the Carson Division. As early as 1905, the Newlands Project diverted a significant amount of the Truckee River flow at Derby Dam; as a result, water levels in Pyramid Lake decreased significantly, and Lake Winnemucca dried up completely by 1967 (Reclamation 2007). For the 27-year period of 1967 to 1994, an average of just over 183,000 acre-feet (173,380 acre-feet per year since 1973) of Truckee River water has been diverted at Derby Dam for agricultural use on Newlands Project farmlands within the Truckee Division near Fernley, Nevada, and within the Carson Division around Fallon, Nevada (State of Nevada 1997).

Diversions to the Truckee Canal have had profound effects on the hydraulic and geomorphic characteristics of the channel. Between 1905 and 1967, Pyramid Lake dropped by more than 80 feet as a result of water diversions, which subsequently caused a lowering of the base level of the Truckee River. The mouth of the Truckee River, where it entered Pyramid Lake became incised as the channel adjusted to this new lowered base level. The incising channel migrated through unstable bank sediments as far upstream of the lake as Numana Dam, further destabilizing the channel and the associated riparian area in this reach. This channel incision caused bank erosion and increased the sediment loads in the lower Truckee River contributing to the development of an expanded delta at Pyramid Lake (USACE 1998). Sedimentation of the delta was so great that the cui-ui's (*Chasmistes cujus*) ability to cross the delta to access the river was greatly impeded. Marble Bluff Dam was designed to arrest headcut erosion along the lower Truckee River and a fish lock was constructed in 1998 replacing the existing fishway to aid migration of Pyramid Lake fishes. Many management actions have been implemented, including changes in diversions at Derby Dam, that have resulted in a nearly 25-foot rise in the level of Pyramid Lake since its historic low in 1967 (Nevada DCNR 1997).

2.2 Purpose of and Need for the Proposed Action

The primary purpose of the three integrated projects is to contribute to the ecological restoration of the lower Truckee River. Overall, the three projects are intended to help restore basic physical and biological functions to a more natural condition so that the ecological systems and native organisms can depend on those functions.

The Lockwood, Mustang Ranch, and 102 Ranch sites were selected by TNC, BLM, Reclamation, and Washoe County in order to restore the river channel, wetlands, and riparian forest and to undo the damage of the anthropogenic changes, including the effects of failed flood protection channelization at those locations. The proposed channel-and-floodplain restoration work to be implemented at the three sites would create a variety of benefits in terms of long-term flood water flow attenuation, water quality, habitats for native plants and animals including special-status species, biological productivity and diversity, invasive weed reduction and control, restoration of native species, and low-intensity recreation opportunities.

Also, as part of Reclamation's funding of these restoration projects, the cities of Reno and Sparks will permanently transfer 250 acre-feet of water annually to the lower Truckee River and Pyramid Lake to meet the DTLP authorization to provide water to Pyramid Lake.

2.2.1 Lockwood

The purpose and need for restoration proposed at the Lockwood site is to provide flood attenuation benefits, recreation opportunities, and a suite of ecosystem benefits, such as improved water quality, wildlife and fisheries habitat, and restoration of native plants. The purpose also includes armoring of an eroding riverbank to protect property on the opposite side of the river, in coordination with the USACE, regional and local government agencies, and property owners.

2.2.2 Mustang Ranch

The purpose and need for restoration proposed at the Mustang Ranch site is to maintain and protect the Truckee River floodplain. BLM proposes to improve conditions along the Truckee River channel by providing a healthy and stable river channel and higher quality riparian and wildlife habitats. TNC and the project partners also propose to provide public access to the river and opportunities for a variety of recreation activities compatible with floodplain needs.

2.2.3 102 Ranch

BLM acquired the 102 Ranch site with the purpose of restoring the health of the river and associated riparian and wetland habitats. The purpose and need for restoration proposed at the 102 Ranch is to provide river and ecological restoration and more natural flood flow attenuation, which would be done in close coordination with the USFWS, the USACE, local governments, and property owners along the river. The site has been identified as a potential location to reestablish river meanders and a portion of the floodplain of the Truckee River. The purpose also includes providing public access to the river and opportunities for a variety of recreation activities compatible with floodplain needs.

Section 3 Description of the Proposed Action and Alternatives

The Proposed Action constitutes a federal action in accordance with CEQ NEPA Regulations (40 CFR 1508.18), under which “actions include new and continuing activities, including projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies” CEQ NEPA Regulations (40 CFR 1508.9) and the Department of Interior Department Manual (516 DM 3.4) require that an EA include a discussion of a range of reasonable alternatives if there are unresolved conflicts over the use of resources. In this case, the range is appropriately limited, as explained below, and two alternatives are analyzed in this EA: the Proposed Action (Section 3.1) and the No-Action Alternative (Section 3.2).

3.1 Proposed Action

TNC, in cooperation with Reclamation, BLM, Washoe County, the City of Sparks, and the City of Reno, propose to implement three integrated river restoration projects along the lower Truckee River at Lockwood, Mustang Ranch, and 102 Ranch. As explained in Chapter 2, the purpose of the three river projects is to help restore basic physical and biological functions of the lower Truckee River and Pyramid Lake to a more natural condition. The Proposed Action also includes providing water to Pyramid Lake via the permanent transfer of 250 acre-feet of water annually to the lower Truckee River and Pyramid Lake.

Restoration activities would be accomplished using federal, state, and local funding. Reclamation and Washoe County have funded the Mustang Ranch and Lockwood restoration projects, and the cities of Reno and Sparks have provided funding for the Mustang Ranch site; the City of Reno and the City of Sparks have provided funding for the final design of the 102 Ranch project; agreements for funding for 102 Ranch are under development. TNC has received commitments from the Truckee River Flood Management Project and Reclamation that will fulfill the implementation funding. Table 3-1 presents information on project funding, area, and current ownership for the three restoration sites.

Table 3-1. Funding, Area, and Ownership for the Lockwood, Mustang Ranch, and 102 Ranch Sites – Lower Truckee River Restoration Project

Site	Funding			Area and Ownership		
	Reclamation	Reno/Sparks*	Washoe County	Acres	River Miles	Ownership
Lockwood	\$1.3 million	—	\$2 million	29	0.6	Washoe County
Mustang Ranch	\$4.2 million	\$0.5 million	\$2.5 million	280	2.5	BLM/TNC
102 Ranch	—	\$0.3 million for final design	—	128	2	BLM

* Does not include the value of the water right associated with 250 acre-feet of water included in the Proposed Action nor the costs/value of lands acquired for restoration purposes.

Under the Proposed Action, TNC and the agency partners would take an active management approach and make a comprehensive and integrated effort to achieve river and ecological restoration at the three sites. The restoration work would involve reconnecting the river to the floodplain; construction of meander sequences; removal of invasive, non-native vegetation; restoring the floodplains and terrestrial areas with native wetland, riparian, or terrestrial vegetation; creating topographical features for wildlife; creating instream habitat and hydraulic diversity for fish; and activities to promote the survival of the plantings and the natural re-establishment and recruitment of riparian vegetation on newly created floodplains.

Several instruments of agreement have been prepared in association with the Lower Truckee Restoration Project. The two primary agreements are the draft “Cooperative Management Agreement between Bureau of Land Management, Carson City Field Office and The Nature Conservancy” (CMA) (Appendix D), and the “Memorandum of Agreement among the USDI Bureau of Land Management, Carson City Field Office (BLM), The Nature Conservancy (TNC), Washoe County (County), Pyramid Lake Paiute Tribe (PLPT), Washoe Tribe of Nevada and California (Washoe Tribe), and the Reno-Sparks Indian Colony (Colony) for Native American Traditional Plant Use at the Lockwood, Mustang, and 102 Ranch Locations” (MOA) (Appendix E).

As a federal steward of public lands, BLM must ensure that the proposed uses to be authorized are consistent with approved comprehensive plans. For the Lower Truckee Restoration Project, the terms of this authorization are documented in the CMA. The CMA establishes a framework and authority for shared management of public lands within the Mustang Ranch and 102 Ranch properties (the Lockwood site is public land managed by Washoe County). As explained in the CMA, both BLM and TNC wish to improve management of these properties to protect and enhance the natural, cultural, and open space resources and to provide the public with greater opportunities to enjoy their public lands. BLM and TNC expect that their shared management will exceed the custodial level of management currently afforded by BLM. The CMA sets forth provisions for both parties. For example, TNC agrees to perform the restoration work described in this EA, obtain and hold specified permits, conduct environmental education assist with routine maintenance of trails, fences, signs, and other improvements, and cooperate on larger scale invasive and noxious weed control programs. In turn, BLM agrees to perform a number of other actions. BLM will apply for and hold other forms of permits or authorizations, including the necessary flowage easements between BLM and the Nevada Division of State Lands; ensure compliance with federal laws, including those protective of the environment; perform wild land fire suppression, and other provisions. The CMA is included in this EA as Appendix D.

The MOA is an administrative mechanism for parties involved to support traditional Native cultural practitioners in propagating and gathering culturally used plants on lands within Washoe County’s Lockwood property and BLM’s Mustang Ranch and 102 Ranch properties. The property managers agree to allow tribal members reasonable access to gather reasonable amounts of plant materials for Native traditional uses without charging a fee. Under the MOA, no plant gathering would occur until the restored vegetation at the three sites is viable for plant gathering, which is expected to be at least three years after planting. The MOA also encourages collaboration to restore and enhance traditionally important plants; the tribes will have the opportunity to provide native plants, seedlings, or seeds for the restoration projects. The MOA includes a list of plant species (see also Table 3-3). The MOA is included in this EA as Appendix E.

The Proposed Action also includes the granting of reciprocal flood conveyance authorizations in the form of (a) a flowage easement from BLM to the State of Nevada to allow for the Truckee River to flow through and flood the public lands within Mustang and 102 Ranch project areas and (b) an easement from the State of Nevada to BLM to use and occupy the land currently within the bed and banks of the Truckee River, whether existing or historic, for restoration purposes.

3.1.1 Design Concepts for the Three Restoration Sites

The proposed restoration effort aims to recreate habitats of high value to native plant and animal species at all three sites described in this EA; the goal is to create the greatest ecological benefit possible with available resources. The site design process was described in detail in the *Preliminary Ecological Restoration Plan for the Upper Lockwood, 102 Ranch, and Mustang Reaches of the Truckee River* (Otis Bay Ecological Consultants 2007a) and other technical design reports, which were subsequently advanced to construction documents. The Proposed Action description in this EA incorporates the restoration design and construction methods from these reports.

The Otis Bay report includes a ranking of the ecological restoration potential of sites along the lower Truckee River. The ranking system used a set of 13 criteria that were individually scored based on field and aerial observations. The 13 criteria measured were: (1) location relative to Derby Dam (river segments above Derby Dam have a more reliable water supply and less altered flow regime than those below and are therefore easier to restore), (2) average floodplain width, (3) potential for floodplain expansion, (4) riparian forest, (5) potential for riparian forest recovery, (6) existing aquatic habitat diversity, (7) potential to increase hydraulic habitat diversity, (8) encroachments into the channel, (9) encroachments into the floodplain, (10) existing entrenchment, (11) floodplain reconnection potential, (12) obstacles to reconnection, and (13) connection to natural features such as oxbow ponds, wetlands, canyons, springs, etc. (natural landscape features or uncommon habitats often enrich the biodiversity of a river segment). The combined totals of each of the individual ranking criteria provided an overall score for each of 20 potential sites along the lower Truckee River. Of the original 20 sites, (Upper and Lower) Lockwood, Mustang Ranch, and 102 Ranch were selected based primarily on their overall high restoration potential score.

The design objective for the Proposed Action includes eight key management objectives for recovery of ecosystem processes (Otis Bay Ecological Consultants 2007a). All eight management objectives would apply to the three restoration sites:

- (1) legal protection of land and water;
- (2) implementing an instream flow prescription that mimics the variability of the natural hydrology;
- (3) protecting ample space away from urban development and uses so the river can reestablish a sinuous channel and riparian forest;
- (4) reestablishing river continuity by removing bypassing, or otherwise modifying in-channel structures that are a barrier to spawning fish migration;
- (5) connecting terrestrial habitats to the river and protecting water quality with suitable connectivity of the river to its floodplain, which enhances nutrient uptake;

- (6) developing habitat complexity by implementing new land management practices that greatly reduce or eliminate grazing, reduce or eliminate predator or problem animal control, create a variety of wetland types, and allow the river to regain its migrating, sinuous pattern;
- (7) releasing the river from artificially hardened banks and reinitiating fluvial dynamics; and
- (8) working with partners to ensure that water quality is improved in the Truckee River.

The preliminary design at each of the three sites was influenced by site-specific conditions related to historical channel characteristics, channel hydraulics, flooding frequency, water temperatures, and sediment transport. Channel reconstruction includes a complete rebuilding of the existing channel and floodplain in order to produce the hydrologic conditions necessary for development of a complex mosaic of vegetation types and hydraulic habitats.

The differences in the design approach for each of the three sites are based on the relative amounts of new acres of wetlands, meanders, riffles, and revegetation, as shown in Table 3-2. Generally, restoration activities at the three sites includes the following elements:

- raising the river and reconnecting it to the floodplain;
- modifying the river channel geometry by narrowing the channel and constructing the meandering channel;
- moving cobble rock to increase bed and bank structure in the river;
- excavating oxbow type habitats at several locations;
- constructing hillocks to add topographic structure;
- constructing habitat features such as burrowing owl dens and marmot burrows;
- grading and preparing for vegetation restoration; and
- restoring vegetation, including seeding, containerized plantings, pole plantings, supplemental watering, and weed control.



Oxbow-type habitats would be created or enhanced as part of the Proposed Action.

Table 3-2. Proposed Design Features for the Lockwood, Mustang Ranch, and 102 Ranch Sites – Lower Truckee River Restoration Project (all values are approximate)

Site	Created Riffle Habitat (linear feet / acres)	Restored Channel Habitat (linear feet / acres)	Created Wetland Habitat (acres)	Created Grassland/ Herbaceous Habitat (acres)	Created Native Shrub Habitat (acres)	Created Native Woodland Habitat (acres)
Lockwood	1,513 ft 4.5	747 ft 2.1	1.8	1.5	4.7	22.0
Mustang Ranch	1,366 ft 3.7	2,563 ft 7.0	10.7	14.8	90.7	60.0
102 Ranch	875 ft 2.5	1,615 ft 4.4	4.9	18.7	23.4	60.0
Total Proposed Action	3,755 ft 10.8	4,925 ft 13.5	17.4	34.9	118.8	140.4

Revegetation will be accomplished with a variety of native plant species. These plants, as listed in Table 3-3, were among those species used in the McCarran Ranch Restoration Project; the list also includes species of value to PLPT, the Washoe Tribe, and the Colony for Native American traditional cultural uses.

Table 3-3. Proposed Primary Native Plant Species List for Revegetation at the Lockwood, Mustang Ranch, and 102 Ranch Sites – Lower Truckee River Restoration Project

Riparian	Wetland	Upland
Fremont cottonwood (<i>Populus fremontii</i>)	Baltic rush (<i>Juncus balticus</i>)	Wyoming sagebrush (<i>Artemisia tridentata</i> ssp. <i>wyoming</i>)
Willow (sandbar, yellow, coyote) (<i>Salix</i> spp.)	Hardstem bulrush (<i>Schoenopletus acutus</i>)	Fourwing saltbush (<i>Atriplex canescens</i>)
Golden currant (<i>Ribes aureum</i>)	Alkali bulrush (<i>Scirpus maritimus</i>)	Green rabbitbrush (<i>Chrysothamnus viscidiflorus</i>)
Wood's rose (<i>Rosa gymnocarpa</i>)	Three-square bulrush (<i>Scirpus americanus</i>)	Bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>)
Creeping wildrye (<i>Laymus triticoides</i>)	Woolly sedge (<i>Carex lanuginosa</i>)	Bottlebrush squirreltail (<i>Elymus elymoides</i>)
Slender wheatgrass (<i>Elymus trachycaulus</i>)	Nebraska sedge (<i>Carex nebrascensis</i>)	Western wheatgrass (<i>Pascopyrum smithii</i>)
Meadow barley (<i>Hordeum brachyantherum</i>)		Sandburg bluegrass (<i>Poa sandbergii</i>)
Inland saltgrass (<i>Distichlis spicata</i>)		Thickspike wheatgrass (<i>Elymus lanceolatus</i>)
Buffaloberry (<i>Shepherdia</i> sp.)		

Lockwood

Based on the Otis Bay ranking system, the Lockwood project site scored a 38 out of 65 in the ranking of ecological restoration potential, which represents a “very good” potential for restoration. The Upper Lockwood segment offers a very good opportunity for active restoration, as a moderately broad floodplain exists to the north of the present channel. There is ample room to raise the riverbed in this segment, increase sinuosity, construct a new meandering channel and establish a well-developed riffle-pool bed structure (Otis Bay Ecological Consultants 2007a).

At the Lockwood project site, the floodplain available for ecological restoration is on the north side of the river, just upstream of the Lockwood Bridge and several adjoining properties. The design features for the Lockwood site include one new meander to the north of about 3.6 acres, approximately 1 acre of new wetlands, 1.5 acres of riffles, and 29 acres of revegetation. Figure 3-1b illustrates the major restoration construction activities that would be undertaken at the Lockwood site, including construction access roads, stockpiles, and staging areas; channel modifications; riverbank armoring and training dikes; and other design features. Figure 3-1c shows the proposed future conditions at the Lockwood site, including the type, location, and extent of planned vegetation communities.

The former residential structure and any associated, inactive on-site utilities will be demolished and removed by construction crews using heavy equipment. The well on the property may be used temporarily for irrigation purposes to get new vegetation established, following which it will be closed and properly abandoned in place by a Nevada-licensed water well driller in accordance with the requirements of the Nevada Division of Water Resources; the septic tank will be abandoned or removed in accordance with the requirements of the Washoe County District Health Department. Debris from the demolished house will be hauled to a proper disposal location. The area will be graded with topsoil and revegetated during the vegetation reclamation phase of the project.

Mustang Ranch

The Mustang Ranch project site scored a 46 out of 65 in the rating system in the ranking of ecological restoration potential, which signifies an “excellent” potential for restoration. The Mustang segment offers opportunities for (1) raising the river’s bed elevation and reconnecting the floodplain, (2) constructing a sinuous meandering channel, (3) developing complex hydraulic habitats as a riffle-pool sequence is established, and (4) establishing a broad, complex riparian forest (Otis Bay Ecological Consultants 2007a).

The proposed design at the Mustang Ranch site is to construct a sinuous channel down the middle of the available floodplain south of its existing river channel location; this would add 9 acres of new meander, 3 acres of riffles, and 140 acres of revegetated native habitat. Figure 3-2b illustrates the major restoration construction activities that would be undertaken at the Mustang Ranch site, including construction access roads, stockpiles, and staging areas; channel modifications; and other design features. Figure 3-2c shows the proposed future conditions, including the type, location, and extent of planned vegetation communities. Upon completion of restoration planting, a wire fence and associated all-terrain vehicle access trail will be constructed around the restored areas.

As shown on Figure 3-2b, the proposed work at the Mustang Ranch site involves relocation of an existing pipeline owned and operated by Kinder Morgan. The pipeline, which delivers various petroleum products including jet fuel, runs the length of the Truckee River from Sparks to Wadsworth

and terminates at the Fallon Naval Air Station. The current pipeline at the Mustang Ranch site is located in the middle of the floodplain, where the new meander is proposed. The Proposed Action would relocate the pipeline to the north side of the existing Truckee River channel, parallel to the railroad.

In order to relocate the existing pipeline, a new alignment will be constructed as shown in Figure 3-2b. The new alignment will require filling approximately 25-foot width of the north side of the existing channel to create a bed in which to bury the new segment of pipeline. This process will require construction of a temporary, active channel crossing. The petroleum product flow will be cut off to the existing pipeline, and a “pig” will be sent through the pipeline in a westerly direction to remove any residual fuel product; the nearest upstream and downstream valves will be closed to prevent any fuel from entering this section of the pipeline. The old segment will be flushed with nitrogen to neutralize any potentially explosive gases. When the new pipeline section is completed, the contractor will conduct pressure tests and leak tests. After the pressure and leak tests are completed, petroleum product flow will be suspended while the construction crew disconnects the old segment and connects the new segment. Once the new pipeline is tested and functional, the majority of the existing pipeline will be excavated and disposed of at an appropriate disposal site. The pipeline at the existing crossing near the bridges will be decommissioned and left in place.

102 Ranch

Based on the Otis Bay evaluation, the 102 Ranch site scored a 54 out of 65 in the ranking of ecological restoration potential, which signifies an “excellent” potential for restoration, even though a considerable amount of engineering design and heavy equipment will be required due to previous gravel mining. Restoration of riparian vegetation, including weed control, will be a major part of this project at this location (Otis Bay Ecological Consultants 2007a).

At the 102 Ranch site, restoration includes two abandoned gravel pits adjacent to the Truckee River channel. The design proposed for 102 Ranch consists of two meanders at the eastern portion of the site. Wetlands are proposed on the north side of the river near the meanders. No hillock construction is proposed at this location. Figure 3-3b illustrates the major restoration construction activities that would be undertaken at the 102 Ranch site, including construction access roads, stockpiles, and staging areas; channel modifications; and other design features. Figure 3-3c shows the proposed future conditions at the site, including the type, location, and extent of planned vegetation communities. Upon completion of restoration planting, a wire fence and associated all-terrain vehicle access trail will be constructed around the restored areas.



Riverbank shaping and rock cluster bank protection would occur along new meanders.

3.1.2 Design Features and Best Management Practices

The proposed restoration work includes the creation of new areas of wetlands, meanders, riffles, habitat features, and revegetation, as discussed below. In addition, Best Management Practices (BMPs), listed below, are incorporated into the Proposed Action and can be expected to reduce adverse effects on the environment. Resource conservation measures developed for the Proposed Action are based on the *Truckee Meadows Construction Site Best Management Practices Handbook* (Kennedy/Jenks 2003).

New Meanders

The channel and floodplain restoration proposed for the three sites entails excavating new meanders to restore sinuosity, decrease slope, reconnect the river to the floodplain, and reestablish native habitat conditions. New meanders will be constructed in the floodplain by excavating new channel segments with heavy equipment, such as bulldozers and excavators. Construction crews will not excavate any soil from areas outside of the channel footprint. The new meanders will be connected to the active river channel by damming and backfilling the adjacent active river channel with rock and earth, diverting the flow into the new segments.



An example of completed bank stabilization along the outside of a new river meander at the McCarran Ranch Project site.

Prior to any in-channel work, construction crews will place a silt curtain across the existing channel at the lower end. To isolate the construction area and prevent sediment contamination, crews will also place a silt curtain at the lower confluence of the old and new channels. Turning flows into the newly



An articulated dump truck would be used to transport rounded rock and create riffle structures.

constructed channel will consist of placing large clean rock into the existing channel. Once flows are directed toward the new channel, the second silt curtain will be placed into the existing channel before completion of the cutoff dam with more large, clean rock and covering the rock-filled segment of the abandoned channel with soil to create conditions suitable for revegetation.

Riffles

Riffle structures will be constructed by purchasing rounded river rock and transporting the rock to each of the three sites. The rock will be moved into the river

with articulated dump trucks and worked into place with an excavator. Riffle structures will help restore the complex set of hydraulic conditions that existed before the channel was altered in the 1960s and improve healthy levels of oxygen in the water for aquatic species.

Wetlands

Construction of new wetlands in the floodplain will occur in abandoned segments of the river channel. Aerial photos and remnant scars in the floodplain indicate that the lower Truckee was once replete with many acres of wetlands; some were leveled and filled for agricultural purposes. The wetlands that remain are dry due to the depressed water table. The restoration activities will entail the use of excavators to excavate new wetlands and deepen pre-existing wetlands in order to connect them to groundwater. Portions of the abandoned channel will also be left open as wetland and backwater areas.

Habitat Features

The excavation of wetlands and construction of new meanders is expected to produce suitable earth material, which will be shaped into hillocks to create more natural undulations and topographic variation at Lockwood and Mustang Ranch (excavated material at 102 Ranch would be used for fill). Hillocks will increase habitat variability for terrestrial species. Existing mature cottonwood/willow forest, riparian shrublands, emergent/wet meadow vegetation, and sagebrush shrublands will be preserved to the maximum extent possible to reduce revegetation costs and improve project success.



Excess soil would be shaped into habitat hillocks at Lockwood and Mustang Ranch.

Revegetation

Revegetation designs for the riparian corridor and associated upland areas at the three sites were developed to improve the overall condition of the vegetation and wildlife habitat. Following construction activities, an intensive revegetation effort will be implemented at each of the three restoration sites. Plantings will occur in various seasons, depending on the vegetation type, location, and construction phase. Earthmoving and revegetation will occur in different years for each site. After planting, 3 years of intensive management (i.e., intensive irrigation, weed control, and general maintenance of the revegetation area) will be required for plant establishment.

Plant materials for each vegetation community type will be selected, as shown in Table 3-3, with an emphasis on establishing the desired native vegetation communities as well as plant species of value to Native American traditional practitioners. Plant materials will be installed at a density sufficient to hasten species development and structural diversity to provide wildlife habitat. The number of plants per acre for each vegetation community type is based on plant spacing equal to a 6-foot on-center density for willows and shrubs, a 10- to 20-foot on-center density for cottonwoods, and a 24-inch on-

center density for wetland and emergent transplants (Otis Bay Ecological Consultants 2007a). Precise species placement within planting locations will depend on final construction designs.

Revegetating riparian and upland areas will require a variety of planting techniques. Upland seeding will require ripping and/or harrowing of areas to be planted. Planting cottonwood poles and willow cuttings will require auguring of holes with a backhoe-mounted stinger and handheld water jet stinger in fine-grained soils where these methods are effective and small excavations with a backhoe in soils that contain more cobble and coarse materials. Planting of bare root and containerized plants will require hand digging of holes with shovels and planting bars.

Post-restoration vegetation harvest by Native traditional practitioners will be implemented as stated in the Memorandum of Agreement (MOA; Appendix E) among BLM, TNC, PLPT, the Washoe Tribe, and the Colony for traditional Native American plant use. The MOA indicates that post-restoration vegetation harvest of culturally used plants will occur at sustainable subsistence levels for personal, ceremonial, or noncommercial use in a manner that promotes ecosystem health. Key native plant species are identified in Table 3-3. The final plant list, based upon input during tribal consultation, is under evaluation by the BLM cultural resource specialists and plant ecologists. Harvest would be conducted only after the plants have reached maturity and are self-sustaining; the land managers require proper notice regarding prior to allowing access to gather plants.

Irrigation

The proposed restoration projects will require supplemental watering to ensure successful seedling establishment and to reduce any transplant stress. Irrigation systems will be installed as necessary. Forested, scrub/shrub riparian, and sagebrush shrublands will require supplemental watering for a minimum of two to three growing seasons (Otis Bay Ecological Consultants 2007a). Watering will be reduced as plants are established. For upland irrigation, the system will require a large diesel pump capable of moving water at a rate of several cubic feet per second (cfs) via aluminum pipes. Drip irrigation will be installed, where needed, and will be operated using a small (2- to 5-horsepower) pump. The exact diameter and number of sprinklers will not be known until construction is complete.

TNC, BLM, Reclamation, and Washoe County intend for TNC to acquire temporary irrigation water leases from the cities of Reno and Sparks for temporary irrigation during the plant establishment period of 3 to 5 years following the initial revegetation efforts. This arrangement was used successfully for the McCarran Ranch restoration project, and the cities, as partners in these three projects, have indicated they will extend the arrangement to include these three sites. After the plant establishment period, TNC will no longer renew the leases, and the cities will maintain control of the water rights.

Best Management Practices and Permit Terms

A number of environmental protection measures and BMPs have been incorporated into the Proposed Action to minimize environmental impacts. Additionally, several construction-related permits and authorizations from federal, state, and local agencies are anticipated that will likely require similar and/or additional protective measures for implementation of the Proposed Action. Permits that would likely be required include:

- (1) Clean Water Act (CWA) Section 404, administered by the USACE, which regulates discharge of dredged or fill materials into waters of the United States;
- (2) CWA Section 401, administered by the State of Nevada, which regulates state water quality standards related to discharges of fill or dredged materials into waters of the United States;
- (3) NPDES stormwater pollution prevention permit program, administered by the State of Nevada, which regulates all point and non-point source pollutant discharges; and Washoe County special use and/or grading ordinance compliance permits; and
- (4) Reciprocal flood conveyance authorizations in the form of (a) a flowage easement granted by BLM to the State of Nevada to allow for the Truckee River to flow through and flood the public lands within Mustang and 102 Ranch project areas and (b) an easement from the State of Nevada to BLM to use and occupy the land currently within the bed and banks of the Truckee River, whether existing or historic, for restoration purposes.
- (5) Temporary Working in Waterways Permit from the State of Nevada Division of Environmental Protection.
- (6) Special Use Permit from Storey County.
- (7) Grading Permit from Washoe County.
- (8) Dust and Vector Control Permits from Washoe County.
- (9) Letters of Permission from the Nevada State Engineer, Nevada Department of Wildlife.

Prior to construction, a “Worker Environmental Awareness Program” for construction workers shall be conducted by a qualified biologist. The program shall provide all workers with information on their responsibilities with regard to sensitive biological resources in the project vicinity.

Phased construction will occur at each of the three restoration sites, combining various activities and BMPs to minimize surface water contact with exposed cuts and fills, and reduce or prevent associated impacts. In general, erosion control and maintenance measures (e.g., hydromulch, erosion control blankets, and sediment logs) will be installed along newly constructed riverbanks; new riverbanks will also use bioengineering techniques that combine plants and rock. Certified weed-free straw mulch will be applied within forested/scrub shrub areas and sagebrush shrublands, where needed. The following activities and BMPs are incorporated into the proposed restoration design and will be included in project plans and specifications and implemented during construction:

- Install safety fencing to protect at-risk vegetation and existing vegetation located near the river access corridors during construction (in addition to constructing a project area boundary fence to control off-highway vehicle access).
- Grade haul roads and clear and grub restoration areas of invasive weeds (e.g., whitetop species) and dispose of by burning or transporting to a landfill (see also Section 4.5.3).

- Execute site access BMPs, including vehicle and equipment cleaning and washing pads and contained fueling and maintenance areas.
- Execute BMPs at stockpiles, including silt fences around the perimeters of fill stockpiles and along the existing channel banks, to entrain wet, excavated material. Install fiber rolls or silt fencing around the perimeters of rock stockpiles if needed.



Proposed construction elements include temporary access roads and stockpiles.

- Spray rock stockpiles to wash away fine sediments and load rock from the top of piles down until it is no longer possible to load rock without picking up soil from the bottom of the stockpile to avoid scooping of fines when loading rock material into trucks. Bottom layer of rock can be used for terrestrial project needs or re-washed.
- Inspect frequently the performance of all BMPs and immediately correct through adaptive management and contingency planning, e.g., install fiber rolls or gravel filtration berms where silt fences are not performing adequately; install gravel filtration berms down-gradient of wetlands if dewatering rates exceed wetland infiltration rates.
- Apply other environmental controls, e.g., dust control and sanitation, as required by other permits.
- Channel migration barrier and berm construction: A channel migration barrier will be constructed, where needed, to prevent the new meander from migrating into utility easements. The migration barrier will consist of an excavated trench filled with boulders and cobbles and covered with soil.
- TNC and their contractors will independently, and in cooperation with the Government, take all reasonable action to prevent and suppress fires on the restoration sites as referenced in the wildland fire mitigation plan for the project approved by the BLM Carson City Office (see also Appendix F, Truckee River Restoration Wildland Fire Mitigation Plan).

3.2 Project Alternatives

An EA must briefly describe alternatives to the proposed action, as required by NEPA (Sec. 102(2)(E)), which requires federal agencies to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” This EA considers the Proposed Action and the No-Action Alternative, as explained below.

3.2.1 Consideration of Alternatives

Many public agencies at all levels of government, as well as non-governmental organizations, tribal groups, businesses, interest groups, and concerned individuals, recognize the ecological and human benefits of restoring the physical and biological integrity of the lower Truckee River. In concept, the most effective means to achieve the underlying purpose of the Proposed Action would be a comprehensive management approach for the entire lower Truckee River that reconnects the river to the floodplain, increases river sinuosity, creates more riparian and wetland habitat, provides water quality and flood attenuation benefits, enhances terrestrial and aquatic habitats, and delivers more water to Pyramid Lake.

As a practical matter, actual restoration sites must be ripe for implementation, particularly in terms of ownership and funding. In considering the entire lower Truckee River, alternative locations are conceivable for conducting river, floodplain, and ecological restoration activities; all such projects would likely be associated with similar short-term environmental impacts and long-term environmental benefits. Not all areas of the lower Truckee River are currently available for restoration, however, due to a variety of ownership, location, timing, funding, and other reasons. Other alternatives that may meet the purpose and need by restoring the natural hydrology and ecology of the Truckee River were not studied in detail because they were considered unfeasible for cost and legal reasons. The three restoration projects at Lockwood, Mustang Ranch, and 102 Ranch are feasible—i.e., ripe for implementation—because they are controlled by public agencies and TNC, entities that are interested and ready to participate in restoration.

TNC, BLM, Reclamation, Washoe County, and the cooperating agencies have considered, and continue to consider, locations along the lower Truckee River where their efforts and financial support for restoration would be best used. A comprehensive assessment, conducted by Otis Bay Ecological Consultants, examined the entire reach and reported on the benefits of restoring the river between Sparks and Wadsworth. The report identified the Lockwood, Mustang Ranch, and 102 Ranch sites as highly ranked for restoration potential and overall improvement to the environment (Otis Bay Ecological Consultants 2007a).

On a project-specific basis, the underlying purpose and need concepts are all addressed in the Proposed Action for the three proposed restoration sites. The three integrated projects are intended to contribute to the overall ecological restoration of the lower Truckee River and Pyramid Lake by helping to restore basic physical and biological functions.

Various restoration design options are conceivable for the three restoration sites; however, variations in river meanders, habitat types, or prescribed acreages do not necessarily present major alternatives that are distinguishable from the Proposed Action in terms of major environmental consequences. The three restoration projects propose future conditions that can reasonably be expected to result in a high level of river and ecological restoration. Variations on these restoration designs are conceivable; however, given the inherent environmentally beneficial nature of the Proposed Action, such variations are not necessary to resolve conflicts concerning alternative uses of available resources nor to avoid significant adverse environmental consequences.

TNC, BLM, Reclamation, Washoe County, and the cooperating agencies did not identify other alternatives in terms of site locations, degree of restoration, timing, or other parameters that provided

meaningful comparisons or reductions in potential environmental consequences, within the meaning and purposes of the NEPA process. Similarly, no issues or comments emerged from public scoping or tribal consultation that suggested consideration of additional alternatives. Thus, the alternatives analyzed in this EA consist only of the Proposed Action and the No-Action Alternative.

3.2.2 No-Action Alternative

Under the No-Action Alternative, TNC, BLM, Reclamation, Washoe County, and the cities of Reno and Sparks would not participate in the ecosystem and river restoration, and no restoration activities would occur at the three sites. The No-Action Alternative is essentially equivalent to continuing the existing conditions and management approach at the proposed three sites along the lower Truckee River. The No-Action Alternative provides a baseline against which the benefits and adverse effects of the Proposed Action can be compared.

Figure 3-1a. Existing Terrestrial and Aquatic Habitat at the Lockwood Site

Figure 3-1b. Restoration Construction Activities at the Lockwood Site

Figure 3-1c. Proposed Future Conditions at the Lockwood Site

Figure 3-2a. Existing Terrestrial and Aquatic Habitat at the Mustang Ranch Site

Figure 3-2b. Restoration Construction Activities at the Mustang Ranch Site

Figure 3-2c. Proposed Future Conditions at the Mustang Ranch Site

Figure 3-3a. Existing Terrestrial and Aquatic Habitat at the 102 Ranch Site

Figure 3-3b. Restoration Construction Activities at the 102 Ranch Site

Figure 3-3c. Proposed Future Conditions at the 102 Ranch Site

Section 4 Affected Environment and Environmental Consequences

4.1 Affected Environment Overview

The following subsections provide selected general information about the existing physical, biological, and human environmental conditions at each of the three Lower Truckee Restoration Project sites.

4.1.1 Lockwood

As stated in Section 1.1, the site was purchased by Washoe County using Federal Emergency Management Agency (FEMA) funds following the 1997 flood of what was formerly a mobile home park. The trailer park has been abandoned; however, associated utilities remain in place. The site is immediately upstream of Lockwood Bridge and the residential community of Rainbow Bend. The Lockwood site is the furthest upstream and the smallest of the three restoration sites, with 0.6 mile of river and approximately 29 acres of floodplain.

The river channel at this site exhibits little meander development; the channel bed is coarse and appears vertically stable, and additional future downcutting is unlikely (Otis Bay Ecological Consultants 2007a). Sediment sources include floodplain deposits, bank erosion, and colluvial sloughing from hillsides on the south side of the river. The average entrenchment is 3.7 feet and the overall erodibility rating is moderate; the presence of an increased amount of fine-grained, low-cohesion bank material increases bank erodibility (Otis Bay Ecological Consultants 2007a).

Existing vegetation at the Lockwood site is a mixture of native and non-native plant species. The overstory tree species include Fremont cottonwood and elm; the relatively sparse understory includes narrowleaf willow and a number of non-native shrub and herbaceous species, including salt cedar, tall whitetop, hairy whitetop, fireweed, and common weeds. Riparian vegetation is limited. (Figure 3-1a illustrates existing conditions and general vegetation types at the Lockwood site.)

An unoccupied duplex rental house (associated with a parcel of land formerly known as the Monday property) is located between Lockwood Road and the north bank of the Truckee River. The former 1.11-acre residential parcel, now owned by Washoe County, contains an abandoned septic tank and water well. A Phase I Environmental Site Assessment for this property was prepared for the Nevada Land Conservancy, acting as interim purchaser for Washoe County. The site assessment identified no evidence of hazardous materials or recognized environmental conditions of concern and recommended that the Land Conservancy and Washoe County abandon the water well and septic tank, remove old vehicles off the property, and conduct an asbestos survey of the duplex prior to obtaining a demolition permit (Robinson Engineering Company Inc. 2006).

4.1.2 Mustang Ranch

The Mustang Ranch site consists of 340 acres (264 acres in Storey County and 76 acres in Washoe County) and includes 2.5 miles of Truckee River frontage. The site is just upstream of the McCarran Ranch restoration site, and encompasses 280 acres of floodplain along the south side of the river. The

majority of the Mustang Ranch site is federal land, managed by BLM; TNC owns a small portion in the northeast part of the property. Since acquiring the site, BLM's management goals have been aimed at restoring water quality, habitat, and flood protection functions.

As a result of the USACE flood control projects in the 1960s, the river at Mustang Ranch is straight and entrenched. Gravel mining activities within the channel have resulted in development of a wide pool downstream; the upstream half of the river consists of a single broad meander containing several gravel bars within the channel (Otis Bay Ecological Consultants 2007a). The disturbance from gravel mining activities within the channel and the presence of levees has disconnected the river channel from the floodplain. River sinuosity has been reduced the most in the lower half of the river at this location. Bank height and slope are moderate to high, and the overall erodibility rating is moderate. Channel banks are largely composed of, and armored by, materials from either dredge piles or constructed levees (Otis Bay Ecological Consultants 2007a).

The Mustang Ranch site currently contains large areas of hairy whitetop, fireweed, and other non-native plants; however, the site also supports more than 13 acres of cottonwood stands and approximately 17 acres of riparian and freshwater marsh vegetation. Existing native shrub vegetation also includes narrowleaf willow, sagebrush, and rabbitbrush. (Figure 3-2a illustrates existing conditions and general vegetation types at the Mustang Ranch site.)

4.1.3 102 Ranch

The 102 Ranch site is 1.6 miles long extends from an abandoned gravel pit pond on the upstream boundary, to the Tracy/Clark Bridge located on the downstream boundary. The floodplain at this site is wider than at the other two restoration sites. During an assessment of restoration sites along the lower Truckee River, the 102 Ranch site was determined to have a high potential for restoration, flood attenuation, and important wetlands that support a variety of wildlife, including amphibian species (Otis Bay Ecological Consultants 2007a).

Two abandoned gravel pits exist north of and adjacent to the channel at the 102 Ranch site. These pits were in operation until the early 1990s; in 1994, the easternmost pit captured the river and permanently changed its course. Currently, the river continues to flow into and out of the eastern abandoned gravel pit pond, which serves as a sediment sink for material transported from upstream. While aggradation occurs in the eastern pond, the western pond threatens to capture the river channel, potentially creating another sediment sink. The high bank, steep slope, shallow root zone, and low degree of cohesion contribute to a moderate to high erodibility rating; average entrenchment within the river is 3.2 feet (Otis Bay Ecological Consultants 2007a).

Existing vegetation at the 102 Ranch site is dominated by non-native herbaceous plants, especially hairy whitetop. Native shrubs include sagebrush and Fremont cottonwood; non-native shrubs include tumbleweed. Cottonwood stands and riparian vegetation are limited. (Figure 3-3a illustrates existing conditions and general vegetation types at the 102 Ranch site.)

4.2 Critical Elements of the Human Environment

BLM's NEPA Handbook (H-1740-1, Appendix 5) identifies "Critical Elements of the Human Environment" that are subject to requirements specified by statute or executive order and must be

considered in all BLM environmental documents. Table 4-1 below lists the Critical Elements and their status in the project area. Critical Elements that may be affected by the Proposed Action are further described in this EA.

Table 4-1. Critical Elements of the Human Environment

Critical Element	Not Present*	Present/ Not Affected*	Present/ May Be Affected**	Rationale used to determine that Critical Elements present in the area would not be affected as a result of implementation of the Proposed Action
Air Quality		X		Construction vehicles and equipment would generate CO and PM ₁₀ . However, effects would be temporary, short in duration, and mitigation measures would reduce adverse impacts.
Areas of Critical Environmental Concern	X			The Proposed Action area is not designated by BLM's applicable plan as an area requiring special management attention by BLM to protect resources or identify hazards
Cultural Resources			X	Cultural sites and other resources were identified as occurring in the Proposed Action area. The restoration sites were inventoried for resources. Results of investigations are addressed in detail.
Environmental Justice		X		Environmental Justice populations occur in the two-county region; however, no disproportionate effects would be expected.
Farm Lands (prime or unique)	X			The Proposed Action area does not include prime or unique farmlands.
Floodplains			X	Restoration activities would occur in the river floodplain. Some attenuation of flood flows is anticipated. No human occupancy is proposed.
Invasive, Nonnative Species			X	Substantial portions of the restoration areas contain invasive plants; management and control of weeds is part of the Proposed Action.
Migratory Birds			X	Migratory birds and their habitat may be affected by construction activities; the long-term effects of the Proposed Action would be beneficial.
Native American Religious Concerns		X		Project implementation includes continued coordination with PLPT, Washoe Tribe, and the Colony.
Threatened or Endangered Species			X	Species listed under the Endangered Species Act have been identified, particularly two species of fish, which are considered in detail.
Wastes, Hazardous or Solid	X			Hazardous and solid wastes are not known or expected to be present at the restoration sites and would not be part of the Proposed Action.

Table 4-1. Critical Elements of the Human Environment

Critical Element	Not Present*	Present/ Not Affected*	Present/ May Be Affected**	Rationale used to determine that Critical Elements present in the area would not be affected as a result of implementation of the Proposed Action
Water Quality (Surface/Ground)			X	Temporary effects related to sedimentation would occur; however, the long-term effects would be beneficial.
Wetlands/Riparian Zones			X	The restoration areas are located within and in close proximity to wetlands and riparian zones. The expected long-term effects would be beneficial.
Wild and Scenic Rivers	X			The Proposed Action would not affect a river segment that is designated as wild and scenic.
Wilderness	X			The Proposed Acton area is not located in a designated wilderness area.

*Critical Elements determined to be Not Present or Present/Not Affected need not be carried forward or discussed further in the document.

**Critical Elements determined to be Present/May Be Affected must be carried forward in the document.

4.3 Environmental Resource Areas Not Considered in Detail

CEQ regulations and guidance encourage lead agencies to focus environmental analyses on resource areas most likely to be affected by the proposed action; other resources do not need to be considered in detail (40 CFR 1502.2(b)). This section briefly addresses resource areas that would be subject to little, if any, environmental effects, either adverse or beneficial. Resource areas that could be subject to potential environmental consequences as a result of implementing the Proposed Action are discussed in more detail in Section 4.4.

4.3.1 Climate

The climate of the Truckee River Basin is characterized by severe winters and short, mild summers. Temperatures in the lower basin are moderate, with a yearly average temperature of 52 degrees Fahrenheit (°F), which includes an average high of 67.7 °F and average low of 36.5 °F. The hottest months are June through September with an average temperature of 66.8 °F. The eastern slopes of the Sierra Nevada are drier than the western slopes, with an annual average precipitation level of 8.5 inches. Precipitation and snowfall are greatest during the months of December through March (Weatherbase 2007).

Implementation of the Proposed Action would include construction activities involving the generation of air pollutants that contribute to increased carbon dioxide (CO₂) emissions and greenhouse gases. Global climate change is a growing environmental issue. Climate change refers to the gradual warming of the earth by the greenhouse effect, which can be measured by wind patterns, storms, precipitation, and temperature. Land use changes, development, construction, transportation, and other human activities that result in greenhouse gases (i.e., water vapor, CO₂, methane, nitrous oxides,

etc.) have been found to have an effect on climate change (EPA 1989). Mitigation measures for air quality impacts have been included in Section 4.2, Air Quality to reduce effects resulting from construction activities.

4.3.2 Geology and Topography

The Truckee River is located in a transitional region between the Basin and Range Province and the Sierra Nevada Province. The project area is a valley surrounded by steep hills; the Pah Rah Mountain range is located to the north and the Virginia Mountain range to the south. Elevations of the valley bottoms range from 4,000 to 6,000 feet, and the elevation of the adjacent mountains range from 6,000 to 10,000 feet. Elevations in the immediate project vicinity range along the river from 4,230 to 4,395.

The geologic characteristics of the project area reflect the Basin and Range Province, which consists of parallel ranges alternating with basins or troughs. The geologic setting of the Truckee River Basin can be described in terms of three phases. The first phase produced the most extensive lithology, which was formed by the intrusion of granodiorite and associated metamorphism and created a mixture of granodiorite surrounded by metasedimentary and metavolcanic rocks. Following the uplift and erosion of these rocks, the second phase was characterized by more volcanic activity, filling valleys and basins with deposits of volcanic flows and debris flows. The third and most recent phase resulted in the deposition of sediments in the present-day basins and valleys (Tabor et al. 1983 as cited in Otis Bay Ecological Consultants).

Two main deformation episodes have occurred in the project area, one late Mesozoic age and the other late Tertiary and Quaternary age. The latter period is more important with respect to development of the Truckee River Basin. Structural features associated with this deformation include normal faulting and associated tilting, warping, wrench faulting, and folding related to faulting (Bonham 1969 as cited in Otis Bay Ecological Consultants 2007a).

Seismic activity in the project area is considered moderate. The probability of an earthquake with a magnitude of 7.0 or greater occurring within the region is between 4 percent and 50 percent. Thirteen earthquakes of magnitude 6 or greater have occurred in the region since 1850. The dominant seismic feature is the Walker Lane fault zone, a major northwest-trending tectonic system that includes Owens Valley and Death Valley, and is characterized as a right-lateral strike-slip shear zone (dePolo et al. 1997 as cited in Otis Bay Ecological Consultants 2007a; Bell et al. 1999).

Erodibility of the Truckee River channel banks at the three restoration sites is considered moderate to high (Otis Bay Ecological Consultants 2007a). At the Lockwood site, the channel bed is quite coarse and vertically stable, and future downcutting is unlikely. The channel at the Mustang Ranch site is vertically and laterally stable, and the bank height and slope are moderate to high. The 102 Ranch site is characterized by a high bank, steep slope, and low degree of cohesion.

The Proposed Action is influenced by the geologic and topographic conditions of the region; however, these environmental areas would not be associated with significant effects affecting implementation of the Proposed Action. Construction activities would temporarily disturb soils during excavation of new meanders, construction of wetlands and riffle structures, and channel reconstruction. Erosion control and maintenance measures, incorporated in the Proposed Action and identified in this EA, would reduce adverse impacts.

4.3.3 Socioeconomics and Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 Federal Register 7629, 1994) requires that federal agencies analyze their programs to assure that they do not disproportionately affect minority, low-income populations, or Indian tribes.

The project area is located east of the cities of Reno and Sparks, within Storey County and Washoe County. The Mustang Ranch and 102 Ranch sites are not located within an established community; however, the Lockwood site is adjacent to the Rainbow Bend residential community. Two Indian reservations and one Indian colony are located in the vicinity of the Proposed Action. The Reno-Sparks Indian Colony is located in Reno within city limits, with a unit in the Hungry Valley area. The Pyramid Lake Indian Reservation surrounds Pyramid Lake and the lower reach of the Truckee River and includes the communities of Sutcliffe, Nixon, and Wadsworth. The Fallon Paiute-Shoshone Indian Reservation is located in Churchill County in west-central Nevada, approximately 10 miles northeast of Fallon.

According to the U.S. Census Bureau, the 2006 estimated population for Washoe County is 396,428; the majority live in the cities of Reno and Sparks. Reno and Sparks have a total population of 205,327 and 84,723 respectively. Approximately 14.4 percent of individuals in Reno and 9.8 percent of the individuals in Sparks fall below the poverty level (U.S. Census Bureau 2006). The ethnic demographic of Washoe County is 76.4 percent White, 5 percent Asian, 2.3 percent Black or African American, 2.0 percent American Indian and Alaska Native, and 0.1 percent Native Hawaiian and other Pacific Islander. The Hispanic or Latino population in Washoe County is 20.3 percent (U.S. Census Bureau 2006) (because the Census Bureau reports race and Hispanic origin separately, totals do not equal 100.).

According to the U.S. Census Bureau, the most recent population and ethnic demographic information is from 2000; there is no data available for Storey County for 2006. Storey County has a total population of 3,399, of which 5.8 percent of individuals fall below the poverty level. The ethnic composition of Storey County is 93 percent White, 1.4 percent American Indian and Alaska Native, 1 percent Asian, 0.3 percent is Black or African American, and 0.1 percent Native Hawaiian and other Pacific Islander. The Hispanic or Latino population in Storey County is 5.1 percent (U.S. Census Bureau 2000).

The Proposed Action would be beneficial to several tribal interests, such as improvements in water quality and quantity, fisheries, and availability of native plant species for traditional uses. Restoration work would generally benefit the surrounding communities by providing access to recreational opportunities and possible minor increases in visitor-support services. No disproportionate effects on minorities or low-income populations are associated with the Proposed Action or No-Action Alternative, and no adverse effects related to environmental justice are predicted.

4.3.4 Transportation and Traffic

The major transportation routes near the project sites are I-80 and the Union/South Pacific Railroad located due north of the Proposed Action area. Access to the Lockwood site is at the Lockwood exit via I-80, which leads over the river to a collector road parallel to the river. A gravel road also parallels the river to the north. The Mustang Ranch site is accessed via I-80, and one road parallels the river to

the south. A gravel road leads directly to the project site. The 102 Ranch site is accessed via I-80 at the eastern edge of the site, after crossing a bridge over the river; a gravel road parallels the river to the south. This section of I-80 has an average annual daily traffic volume of an estimated 32,500 vehicles (Nevada DOT 2006). The gravel roads are primarily used by a limited number of local personal and commercial vehicles.

Construction activities would require a number of trucks and worker vehicle trips on I-80 and the gravel roads leading to and from the restoration project areas. Prior to construction, loads of rock, cobble, and other material would be delivered to the project sites and stored at the staging areas and designated on-site storage areas. Material would be hauled for the first few months of construction. During construction, most of the construction equipment would be kept on-site. Any increase in vehicular traffic would be small (10 to 15 vehicles). Because the work would be conducted near the stream channel and away from roadways, little to no disruption of traffic flow would occur. Current access locations from public roadways will be adequate for construction. No new permanent access roads would be needed for construction, operation, or maintenance purposes. Most temporary access roads at all three sites will be abandoned and revegetated after project restoration work has been completed, unless needed for long-term (controlled) access and maintenance.

Post-construction activities (i.e., revegetation, maintenance, and monitoring) would require intermittent access for 3 years. More recreation opportunities and access to the project sites could result in a small increase in visitors to the area; however, the associated traffic increase would be minor. Existing traffic volumes on area roads are low, and the increase in traffic from construction would be temporary. The Proposed Action would not be associated with significant transportation or traffic issues.

4.3.5 Visual Quality

Visual quality is determined by aesthetic attributes such as form, color, line, mass, and texture that comprise the overall visual character of a scenic vista. High visual quality typically exists in areas where views are rare, unique, or in other ways notable, such as in remote or pristine environments. Highly sensitive views would include landscapes that consist of landforms, vegetation, water bodies, rock formations, or other features of unusual or outstanding quality (i.e., natural coastlines, streams and other river corridors, designated historic districts, and designated scenic vistas and byways). How frequently a scenic vista is viewed and whether the views are short-range, mid-range, or long-range are also importance determinants of viewshed sensitivity.

According to the Washoe County Comprehensive Plan (Washoe County 1994), the project area is designated as a scenic corridor. The Truckee River flows through a valley characterized by dry grasslands and sagebrush scrub; the slopes of the mountains are dry and barren. Stands of cottonwoods are located near the river, but non-native herbaceous vegetation such as tall whitetop dominates the area. The general visual quality in the vicinity of the three restoration projects is moderate, based on natural landscapes, the low-level of development, proximity to I-80, and presence of utility lines, roads, and other signs of human occupation. Primary views of the project area are from I-80 and, to a lesser extent, from local gravel roads.

Implementation of the Proposed Action would be associated with changes in the visual environment. Construction vehicles and activities would be associated with minor, temporary changes in views,

including the potential creation of air-borne dust. Over the longer term, the increase in vegetation and habitat structure would improve the local viewsheds. The Proposed Action can be expected to improve the visual quality by replacing tall whitetop and scrub-shrub fields with riparian forest, wet meadows, and emergent wetlands. The environmental consequences in the long term (for example, in terms of views from I-80) are expected to be beneficial.

4.3.6 Noise

The primary sources of noise in the project area are traffic on I-80 and freight and passenger trains on the Union/South Pacific Railroad. A few industrial buildings and the Rainbow Bend residential community are located in the area, but are not major sources of noise. Sensitive receptors in the project vicinity include residents of the Rainbow Bend community, industrial employees who work in the area, and wildlife.

Construction activities would result in short-term increases in noise levels that could affect nearby sensitive receptors. In order to minimize noise impacts, construction equipment would be equipped with standard noise-reducing devices. Construction contractors would be responsible for providing personnel with required hearing protection during operation of construction equipment. Hearing protection would comply with federal and state standards. Wildlife affected by the noise may be temporarily displaced, but would be expected to return following completion of the restoration work.

Both Washoe County and Storey County specify noise standards in their planning documents and zoning codes, and temporary construction activities are exempt in both counties. Construction activities in Storey County are exempt from the decibel limits found in the county ordinance as long as human health is not adversely affected. Construction activities associated with the Proposed Action would not cause health problems because of the limited number of sensitive receptors in the project area. Washoe County's Development Code (Washoe County 2004) specifies that temporary construction, repair, or demolition activities occurring between 7:00 a.m. and 7:00 p.m. on any day except Sunday are exempt. Construction activities would occur on weekdays between 7:00 a.m. and 7:00 p.m. and no adverse effects from noise are anticipated.

4.3.7 Energy

The Proposed Action is not anticipated to significantly affect energy resources. Construction activities associated with the Proposed Action would involve the use of non-renewable resources such as petroleum products; however, no ongoing consumption of energy is anticipated once the restoration work is complete.

4.3.8 Land Use

The Truckee Meadows Regional Planning Agency (TMRPA) is made up of members from the cities of Reno and Sparks and Washoe County, and is responsible for implementing the *Truckee Meadows Regional Plan* (TMRPA 2006) to ensure that master plans of local governments are consistent with the Regional Plan. According to the Regional Plan, the project area is located within the Truckee Meadows Service Area (TMSA) and the City of Sparks Sphere of Influence. Washoe County manages land use through the Comprehensive Plan (Washoe County 1994), more specifically through the Truckee Canyon Area Plan. Article 222 of the Washoe County Development Code establishes special regulations to supplement the general regulations in the Truckee Canyon Area Plan, and

outlines specific Truckee River Corridor Standards. The Proposed Action is consistent with the land use management guidelines established in these plans and regulations.

Washoe County's zoning designations for the Mustang Ranch site are: "General Rule" (GR), "Multi" (more than one regulatory zone), and "Open Space" (OS), and the 102 Ranch site is zoned GR. The portion of Mustang Ranch owned by TNC is zoned GR. GR refers to land with severe development constraints, land that should be preserved for conservation reasons, or land that is not planned to receive the services and facilities needed for development in the near future (Washoe County 1994). Storey County has zoned Mustang Ranch site as an Agricultural zone, and the 102 Ranch site as I-2 Heavy Industrial.

Federal land management authority supersedes local land use planning. BLM's land use planning document, the *Carson City Field Office Consolidated Resource Management Plan* (BLM 2001), governs the land use and management policies for the sections of the Mustang Ranch and 102 Ranch properties owned by BLM. Any development on these sites would be consistent with the management guidelines established for BLM public lands.

The Lockwood site is owned by, and located in, Washoe County. The site currently has land use designations of Low Density Urban (LDU), General Rural (GR), Low Density Suburban (LDS), and General Commercial (GC) within the Washoe County Comprehensive Plan. The use of the site for restoration, wildlife habitat, low-intensity recreation, and floodwater attenuation would not promote development in the floodplain or expose people to hazardous conditions. The activities anticipated under the Proposed Action would be allowable uses under Washoe County's land use authority (Whitney pers. comm. 2007). The land is also within the City of Sparks' exerted jurisdiction, and the City required a Master Plan Amendment to convert the land use designations to one single designation of Open Space. This planning change made the proposed use of the site for restoration, wildlife habitat improvement, low-intensity recreation, and floodwater attenuation more clearly compatible with the assigned land use designation, and thus helped to ensure that the proposed uses would conform to the City of Sparks' and Washoe County's planning vision for the Truckee Canyon.

4.3.9 Recreation

Currently there are no developed recreational facilities in the project area; however, the Truckee River provides a variety of potential recreational opportunities. Currently, recreational opportunities in the area are somewhat limited due to the steep topography, sparse desert vegetation, limited access to the river, and lack of developed recreational facilities.

Implementation of the Proposed Action would likely draw additional visitors to the area and allow for more low-intensity recreational opportunities, including use of non-motorized watercraft, fishing, wildlife observations, outdoor relaxation, and the development of regional hiking and bicycle trails. Recreational visitor uses could affect wildlife habitat by disturbing vegetation or displacing resident and migratory wildlife species. The level of recreation use is likely to increase in the future, with or without the Proposed Action, potentially resulting in localized impacts to wildlife habitats. Land managers, who are generally aware of these potential effects, regularly set restrictions on access or types of recreational use. Other management activities, including public education, seasonal closures, and designations of use areas, may be used to reduce recreational impacts.

4.4 Environmental Resource Areas Considered in More Detail

4.4.1 Air Quality

Affected Environment

The Nevada Division of Environmental Protection, Bureau of Air Pollution Control (BAPC) and the Bureau of Air Quality Planning (BAQP) have the authority to implement state and federal air pollution control requirements. The BAPC has jurisdiction over air quality programs in all Nevada counties except Washoe County. Washoe County has its own air quality agency, the Washoe County District Health Department Air Quality Management Division (AQMD), which serves Washoe County and the cities of Reno and Sparks.

The 1977 federal Clean Air Act (CAA) requires the Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for the following criteria air pollutants: ozone (O₃); carbon monoxide (CO); nitrogen dioxide (NO₂); sulfur dioxide (SO₂); suspended particulate matter (PM₁₀ and PM_{2.5}); and lead (Pb). Table 4-2 presents the National Ambient Air Quality Standards.

The EPA has classified areas as either “attainment” or “non-attainment” for each criteria pollutant. “Attainment” means that the NAAQS have been met, and an “unclassified” designation indicates the area cannot be classified based on available information. Washoe County is currently designated moderate non-attainment for CO and serious non-attainment for the 24-hour PM₁₀ standard. EPA has designated Washoe County as attainment for the 8-hour ozone standard and 24-hour and annual PM₂ NAAQS. In January 2005, Washoe County recorded an exceedance of the 24-hour NAAQS, which was the first 24-hour exceedance since 1999 (AQMD 2006). Washoe County was designated a marginal ozone non-attainment area until the EPA rescinded the 1-hour standard in 2005 (AQMD 2006). EPA has not designated Storey County non-attainment for any of the criteria air pollutants.

Table 4-2. National Ambient Air Quality Standards

Pollutant	Symbol	Average Time	Standard (parts per million)	Standard (micrograms per cubic meter)
Ozone	O ₃	1 hour ¹	—	—
		8 hours	0.08	N/A
Carbon Monoxide (Lake Tahoe only)	CO	8 hours	9.0	10,000
		1 hour	35	40,000
		8 hours	N/A	N/A
Nitrogen dioxide	NO ₂	Annual average	0.053	100
		1 hour	N/A	N/A
Sulfur dioxide	SO ₂	24 hours	0.14	365
		1 hour	N/A	N/A
Hydrogen sulfide	H ₂ S	1 hour	N/A	N/A
Vinyl chloride	C ₂ H ₃ Cl	24 hours	N/A	N/A

Table 4-2. National Ambient Air Quality Standards

Pollutant	Symbol	Average Time	Standard (parts per million)	Standard (micrograms per cubic meter)
Inhalable particulate matter	PM ₁₀	Annual arithmetic mean 24 hours	N/A N/A	50 150
		Annual arithmetic mean 24 hours	N/A N/A	15 35 ²
Sulfate particles	SO ₄	24 hours	N/A	N/A
Lead particles	Pb	Calendar quarter 30-day average	N/A N/A	1.5 N/A

Source: EPA 2007

Notes:

N/A Data not available.

¹ The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

² U.S. EPA lowered the 24-hour PM_{2.5} standard from 65 ug/m³ to 35 ug/m³ in 2006. EPA has not yet determined the attainment status of BAAQMD for the new standard.

Washoe County AQMD has air quality monitoring sites scattered throughout the county; the Sparks monitoring site, which is the closest site to the Proposed Action, is located approximately seven miles west of the Lockwood project site. Air quality data from this monitoring site are shown in Table 4-3 below.

Table 4-3. Criteria Pollutant Concentrations at the Sparks Monitoring Site (1995–2006)

Year	PM ₁₀		CO		O ₃	
	Annual Average	High	Annual Average	High	Annual Average	High
1995	27	59	1.17	7.16	0.023	0.091
1996	26	89	0.81	6.36	0.025	0.100
1997	30	82	1.50	7.72	0.022	0.084
1998	29	61	1.84	6.95	0.027	0.094
1999	30	59	1.97	7.07	0.027	0.116
2000	27	68	1.39	5.44	0.025	0.087
2001	29	78	1.37	5.23	0.024	0.091
2002	29	73	1.46	4.79	0.024	0.098
2003	27	85	1.33	4.03	0.027	0.099
2004	29	90	1.23	3.92	0.025	0.086
2005	29	72	0.60	3.32	0.026	0.083
2006	28	76	0.68	3.46	0.027	0.107

Source: AQMD 2006

Environmental Consequences

No Action

Under the No-Action Alternative, no earthwork or restoration activities would occur at the three sites, and therefore no heavy equipment would generate air pollutants. Air quality presumably would continue to be designated moderate non-attainment for CO and serious non-attainment for the 24-hour PM₁₀ standard under the NAAQS. Increased traffic and land use development in the cities of Reno and Sparks would continue to contribute pollutants that affect the vicinity of the project area as a result of construction activities and vehicular use.

Proposed Action

Construction activities associated with the Proposed Action would generate emissions from diesel- and gasoline-powered equipment and vehicles. The operation of equipment during the restoration work would cause an increase in NAAQS pollutants, such as reactive organic gases (ROG), PM₁₀, CO, nitrogen oxides (NO_x) and sulfides (SO_x). Equipment would include large track excavators, small track excavators, haul trucks, track loaders, bulldozers, water trucks, and service trucks. Emissions associated with the Proposed Action in the short term would be related to construction, and air quality parameters would generally return to pre-construction conditions following construction except for vehicles and equipment required for irrigation systems and other routine maintenance. Diesel-powered pumps, for example, would be needed for irrigation for up to three years after construction, and use of other maintenance equipment and vehicles would also be anticipated to generate particulate matter and other air pollutants.

Construction-related emission levels were estimated for the construction phase of the McCarran Ranch restoration project and are shown in Table 4-4. The results concluded that emissions would not exceed *de minimis* threshold levels established by the EPA for conformity analysis.

The Proposed Action would involve similar construction periods, types of equipment, and number of workers as the McCarran Ranch restoration project. Based on this comparative analysis, the Proposed Action would not violate any air quality standards or expose sensitive receptors to significant levels of pollutants. Construction vehicles and equipment, however, would temporarily contribute to existing problems with CO and PM₁₀; diesel-powered motors and generators, other equipment, and vehicles would also generate pollutants after construction. Accordingly, the following measures should be implemented to minimize air quality emissions during construction and subsequent maintenance activities.

Table 4-4. Estimated Construction-Related Emission Levels for the McCarran Ranch Restoration Project and Federal *de minimis* Air Quality Standards.

Equipment	ROG	PM₁₀	CO	SO_x	NO_x
Excavators (lbs/day)	4.14	3.06	10.26	3.276	34.2
Loader (lbs/day)	0.57	0.354	1.206	0.456	4.98
Dump trucks (lbs/day)	3.60	3.36	16.2	3.432	40.8
Dozer (lbs/day)	0.60	0.64	2.7	1.4	6.8
Water truck (lbs/day)	0.76	1.04	7.2	1.8	16.68
Service trucks (lbs/day)	0.16	0.24	7.2	0.4	3.76
Hydroseeding truck (lbs/day)	0.76	1.04	7.2	1.8	16.68
Bobcat lbs/day	0.156	0.24	0.6	0.344	0.216
Worker autos (lbs/day)	0.11	0.032	2.55	0.016	0.43
Total (lbs/day)	10.096	10.006	55.116	11.524	119.616
Total (tons/year)	2.0	2.0	10.0	2.0	22.0
Federal Standards (tons/year)	100	100	100	100	100

Source: USACE and TNC 2005

Mitigation Measures

The following mitigation measures should be implemented to reduce adverse effects pertaining to air quality; these include, but are not limited to, requirements to:

- (1) Properly maintain all equipment and engines.
- (2) As a general rule, keep all equipment and engines idling below 10 minutes.
- (3) Encourage workers to carpool to the construction area.
- (4) Schedule the movement of construction materials during off-peak hours for travel.
- (5) Use water trucks to reduce airborne dust from leaving the project site. Require increased water frequency whenever wind speeds exceed 15 miles per hour. Emphasis would be placed on watering unpaved roadways during periods of high vehicle movement.
- (6) Limit the speed for all construction equipment to 10 miles per hour on any unpaved surface.
- (7) Do not excavate or grade soils during periods in which wind speeds are greater than 20 miles per hour averaged over one hour.
- (8) Maintain at least 2 feet of freeboard on trucks hauling loads of excavated materials, and cover loads of all haul/dump trucks securely on days with high winds or when traveling at speeds to cause dust to be released from the vehicles.

(9) All equipment would enter and leave the construction site by the same designated route to reduce airborne dust.

(10) Use BMPs with excavated soil stockpiles to reduce wind erosion; measures include, but are not limited to, covering with tarps or spraying with water to control dust.

4.5 Hydrology and Water Quality

4.5.1 Affected Environment

Hydrology

The Truckee River basin encompasses approximately 3,100 square miles and includes a land area stretching from its headwater origins in the Sierra Nevada mountains and draining into Pyramid Lake. The river flows 140 miles from Lake Tahoe to its terminus at Pyramid Lake. Flows in the Truckee River are dictated by surface runoff, snowmelt, and the operation of multiple flood control features, hydroelectrical generation projects, water storage reservoirs, and agricultural and municipal diversions. Flows are typically highest during the spring months, peaking in May and June as the snow pack in the Sierra Nevada melts and flows decrease to annual base levels through the summer and fall months.

The climate of the Truckee River basin is generally dry and is characterized by cycles of flood and drought, in which precipitation and runoff can vary widely from year to year (Bureau of Reclamation et al. 2008). The majority of the yearly precipitation occurs between October and March. Precipitation is mostly in the form of snowfall and averages 8.5 inches per year (Weatherbase 2007); the flow regime is dominated by the seasonal high flow period occurring between April and July with minimum flows occurring in fall and winter (USACE and TNC 2005). Excessive runoff from rain and snow events can occur during the summer or the fall. Based on records from the USGS gage located closest to the Proposed Action area (located at Vista, Nevada just upstream of the Lockwood site), the daily mean discharge has recently averaged 816 cfs, ranging from a minimum of 7 cfs to a maximum of 17,400 cfs, respectively (Otis Bay Ecological Consultants 2007a and NSR 2008).

Floods in the Truckee River basin can be characterized as three distinct types: (1) rain floods, which occur during November through April following rainstorms over large portions of the basin resulting in 3- to 5-day peak flows with relatively small total volumes; (2) cloudburst floods, which occur during the summer resulting in short-duration peak flows with low volumes but frequently carrying large amounts of debris and sediment; and (3) snowmelt floods, which occur during the snowmelt in spring through early summer and have relatively high volumes and long-duration peak flows. The existing 100-year flood flow (sometimes referred to as the “base flow” for flood management purposes) at the Vista gage on the lower Truckee River is reported to be 20,171 cfs (Montgomery Watson Harza 2002). By comparison the largest recent flood event that occurred in January 1997 was measured to peak at 20,691 cfs at this same site (Montgomery Watson Harza 2002).

Water Quality

Water quality in the Truckee River is affected by a variety of sources, including sediment releases from land use practices and geomorphic processes, agricultural runoff, urban runoff, land development, mining, flood control features, and wastewater treatment plant discharges. The State of

Nevada has determined that the Truckee River in various reaches is impaired under the provisions of Section 303(d) of the CWA due to excessive temperature, total phosphorus, and turbidity; however, the level of impairment to beneficial uses of the Truckee River caused by these parameters varies along the length of the river (Nevada Division of Environmental Protection 2005).

Within the potentially affected area (Lockwood to Derby Dam), the lower Truckee River is listed as impaired due to excessive phosphorus and turbidity levels (Nevada Division of Environmental Protection 2005). The primary adverse impacts associated with excessive nutrients and turbidity in the Truckee River pertain to degradation of habitat for aquatic organisms. The NDEP has established Total Maximum Daily Loads (TMDLs) for total nitrogen, total phosphorus, and total dissolved solids for the Truckee River (Nevada Division of Environmental Protection 2005). Availability of elevated phosphorus and nitrogen in the Truckee River provides suitable conditions for excessive algal growth during the summer months, which can lead to reduced dissolved oxygen levels and in turn affect the health of many sensitive fish species.

Additionally, elevated water temperatures resulting from impacts to flows caused by land use practices, unintended side effects of flood control management, and water diversions have further contributed to the historic population declines of native fish populations. Elevated temperatures in combination with increased algal growth and decay of organic matter in the Truckee River and low flow conditions can also lead to acute and chronic depression of dissolved oxygen levels with lethal consequences for fish.

Another source of potential water quality impairment of the Truckee River is the presence of heavy metals, including mercury. Although the river is not listed under Section 303(d) of the CWA for mercury impairment, concentrations of mercury have been found in water, sediment, and biota (fish and crayfish) in the lower Truckee River (Higgins, Tuttle, and Foote 2006; Lawrence 1998). Studies have identified Steamboat Creek as a source of mercury input into the Truckee River due to historic gold and silver mining operations during the Comstock era in the Washoe Valley (Lyons et al. 2004). The calculations completed by Lyons et al. (2004) demonstrate that over 50 percent of the total mercury entering the lower Truckee River could be from Steamboat Creek and is undoubtedly due to previous mercury contamination from the Comstock mining era.

Mercury is considered highly toxic, especially in its methylated form, and even trace amounts in water, sediment, and diet have been associated with adverse effects to fish and aquatic invertebrates (Higgins, Tuttle, and Foote 2006). Specific biochemical conditions are required for the methylation of elemental mercury to occur, such as can exist in some moist soils and certain types of wetland sediments (Environmental Protection Agency 1997). Based on a preliminary assessment of contaminants and potential effects (Higgins, Tuttle, and Foote 2006), fish tested from the Truckee River contained metals and trace elements, including mercury. However, mercury concentrations in trout collected near Reno and Tracy did not exceed the environmental threshold levels of concern determined by Beckvar et al. (2005), as cited in Higgins, Tuttle, and Foote (2006). Similarly, mercury concentrations in these trout samples were well within the PLPT tribal standard for mercury. No site-specific data are currently available to determine whether the Proposed Action would be a net inhibitor or enhancer of the methylation of mercury.

4.5.2 Environmental Consequences

No Action

Under the No-Action Alternative, the localized hydraulic and aquatic habitat conditions of the river channel would remain the same or worsen. It is probable that, left alone, the river channel would become wider and shallower over time. It is unlikely that site-specific water quality would change with the No-Action alternative. This alternative would not change the existing hydraulic conditions affecting localized erosion of riverbanks at the Proposed Action project sites, which could worsen with time and contribute to increases in suspended particles and sediments in the water column. It is also possible that mercury and other heavy metals currently buried in the riverbank sediments could become mobilized as banks erode and the channel widens. Additionally, water quality would be unlikely to improve at the restoration sites as a result of continued municipal, industrial, agricultural uses and other human activities.

Proposed Action

Hydrology

The Proposed Action would cause long-term changes to the current hydrologic regime by reconnecting the river channel to its floodplain and reestablishing a natural, dynamic, meandering channel pattern at the restoration sites. Permanent changes to the water flow, sinuosity, surface and groundwater depth, and wetland areas would occur. Construction of new meanders would reroute the water, ultimately narrow the riverbanks, and increase the water depth within the channel. The design objectives include more frequent localized overbank inundation, creation of wetlands, and raising the groundwater table. The Proposed Action is expected to provide an overall benefit to river hydrology and water quality, as well as improve habitat quantity and quality, while maintaining the benefits of existing and proposed flood control management features.

During the scoping process for this EA, concern was expressed that the proposed restoration activities at the Lockwood site could exacerbate the riverbank erosion that is occurring across the river, which poses a threat to a roadway, structures, and properties on the south side of the river. Under the Proposed Action, the construction work at the Lockwood site would include the installation of heavy, engineered rip-rap along the riverbank at this location (see Figure 3-1b). A combination of boulders and cobbles would be used, with the larger, heavier boulders keyed into the riverbank 2 feet below the maximum channel depth, with gradual reduction in rock size up to the top of the bank. Existing trees will be protected in place, with the riprap installed around them. This heavy riprap will serve to armor the riverbank, greatly reduce the erosion threat, and help to protect the roadway and improvements.

Topographical constraints at the Lockwood site would cause overbank flooding to occur first on the north side of the river where an available floodplain exists. Intended over-bank inundation will occur within this northern portion of the Lockwood site during high-flow events; flooding would be expected to occur primarily on the northern side of the river based on current designs. Currently, the channel bed is quite coarse, appears vertically stable, and additional future downcutting is unlikely (Otis Bay Ecological Consultants 2007a). Modifications to river sinuosity taking place at the Lockwood site will occur in the area north of the site of bank erosion concern, and may alleviate to some extent erosion potential at this site by providing a moderate hydraulic “relief valve” by allowing rising waters to spread further onto the north bank floodplain, thereby directing high flows away from the south bank.

The potential effects of the Proposed Action on localized flood damage risk was evaluated by comparing existing and restored, re-aligned channel condition water surface modeling results for the Lockwood and Mustang Ranch restoration sites (Otis Bay Ecological Consultants 2007b, 2007c). Modeling results were not available for the 102 Ranch site; however, it is anticipated that they would be similar to the results for the other sites since the same channel realignment design criteria are being applied there. The Lockwood site was considered the most important site for this evaluation due to the proximity of residential and roadway infrastructure to the proposed river channel and floodplain restoration site. Differences in water surface elevations between the existing and proposed restored channel for the 100-year flood at both sites were typically less than 1 foot. At the upstream-most end of the Lockwood site, water surface elevations would be increased by 1.34 feet at 20,000 cfs and 1.69 feet at 24,000 cfs, where a series of riffle reconstructions is proposed to correct a steep drop structure by gradually decreasing the river gradient through this reach. Water surface elevations throughout the remainder of the Lockwood restoration site and at the Mustang Ranch site are predicted to differ by less than a few hundredths of a foot between existing and restored channel conditions (Otis Bay Ecological Consultants 2007b, 2007c). Therefore, no significant change in flood potential is expected to result from proposed channel and floodplain restoration at these sites.

Water Quality

The Proposed Action would ultimately create long-term benefits associated with water quality. One of the design objectives is to work with partners to ensure that water quality is suitably maintained in the Truckee River. A narrower, deeper, and shaded channel should result in lower water temperatures over time (Otis Bay Ecological Consultants 2007a). Restoration of the riparian habitat along the banks of the river would create more shaded areas and lower water temperatures, as well as reduce erosion of the riverbanks and consequently reduce the amount of total sediment entering the river. These improved water quality conditions will, ultimately, contribute to improving the overall quality of aquatic habitat for fish and other water dependent organisms.

The proposed design at the three sites involves construction of new river meanders to restore more natural channel geometry. Water quality would be temporarily affected by the construction of and release of water into each newly constructed meander. Earthen “plugs” would be left in place during construction to keep the water and sediment from entering active channel; once the work is complete, the plugs would be removed and water would be allowed to enter. Sediment would be released into the river in a controlled manner during the removal of each plug with an excavator, which would temporarily increase localized suspended sediment and turbidity. Potentially adverse effects to water quality would also occur during construction of the riffles, when rock fill material is moved into the water by articulated dump trucks and placed into the river channel by an excavator. These disturbances are expected to be temporary, largely localized, and limited in effect through the installation and use of silt curtains.

Construction in the river to place rock fill material will not significantly exacerbate the already high background levels of turbidity and suspended sediment in the Proposed Action area (NSR 2008). The potential exists that an unknown amount of mercury within floodplain deposits on the existing riverbank could be liberated during restoration construction activities. However, most of the bank materials to be excavated will be spoiled in upland areas to create hillocks above of the floodplain or fill portions of vacated river channel and will not be placed directly in contact with the river; therefore, restoration construction is not likely to exacerbate mercury contamination in the river. Additionally,

no directional boring or other construction techniques are proposed that would require the use and possible release of drilling fluids, thus obviating such potential adverse effects to water quality and aquatic habitat.

Herbicide use during restoration activities at the three sites could affect water quality if overspray or spills enter the water. Proper protocols will be implemented to reduce the potential for water contamination. The potential for herbicide contamination is expected to be low as long as the chemicals are applied by certified operators, equipment storage areas are set back from the river, and other BMPs are effectively implemented.

The potential spill of hazardous materials (i.e., oil, grease, gasoline, and solvent) during construction and staging activities in the Truckee River could have deleterious effects on water quality. Additionally, operation of construction equipment in or adjacent to the river will increase the risk of a spill of hazardous materials into the river. Construction activities typically include the refueling of construction equipment on location. As a result, minor fuel and oil spills could occur, and there would be a risk of larger releases. Without rapid containment and clean up, these materials could be toxic, depending on the location of the spill in proximity to surface water features.

4.5.3 Mitigation Measures

The contractors would comply with all required federal, state, and local permits, and implement the associated erosion control and other BMPs. The following management measures will be implemented to avoid and minimize the potential for adverse effects of turbidity or suspended sediments during in-water and upland construction and in planning and execution of directional bore operations:

1. TNC and its contractors will prepare and implement a water quality and sediment control plan for the Proposed Action. The plan will identify BMPs for the projects, including silt fences, sediment filters, watering, and routine monitoring to verify effectiveness. Proper implementation of erosion and sediment controls shall be adequate to minimize sediment inputs into the Truckee River until construction ends. All sediment containment devices and erosion control devices will be inspected daily during the construction period to ensure that the devices are functioning properly. Silt curtains will be installed in order to minimize the amount of turbid water escaping the construction site and to prevent settleable solids from drifting outside of the immediate project work site. Silt curtains shall be kept in good working order; they shall be designed to allow fish that may enter the curtained area adequate passage to exit freely.
2. Any new or previously excavated gravel material placed in the Truckee River channel shall be washed of foreign materials prior to installation. Water containing mud or silt from aggregate washing or other operations shall be treated by filtration or retention in a settling pond or ponds adequate to prevent muddy water from entering the river.
3. The contractor shall not perform any clearing and grubbing or earthwork on the project until the State Water Pollution Prevention Plan (SWPPP) has been accepted.
4. All work within the river channel will occur when the river has low flows.

In the final design for the Lockwood site, TNC and its design contractor shall ensure that the proposed new channel does not exacerbate erosion problems near roadways and structures.

Construction plans and specifications shall include measures to reduce potential impacts on water quality associated with accidental spills of pollutants (fuel, oil, grease, etc.) in the Proposed Action area, including the following:

1. Equipment and materials shall be stored away from wetland and surface water features.
2. Vehicles and equipment used during construction shall receive proper and timely maintenance to reduce the potential for mechanical breakdowns leading to a spill of materials. Maintenance and fueling shall be conducted in an area at least 150 feet away from waters of the Truckee River or within an adequate fueling containment area.
3. The contractor will develop and implement site-specific Best Management Practices (BMPs), a water pollution control plan, and emergency spill control plan. The contractor will be responsible for immediate containment and removal of any toxins released.
4. In regard to dewatering activities, all material and water required for excavation and installation will be contained and disposed of in accordance with the required regulatory permits.

To reduce potential impacts associated with accidental spills or leakage of petroleum products from work related to the realignment of the Kinder Morgan Pipeline, the following measures shall be implemented:

1. The contractor working on the pipeline will develop and implement site-specific Best Management Practices (BMPs), a water pollution control plan, and an emergency spill control plan.
2. The contractor will be responsible for immediate containment and removal of any petroleum products or other harmful pollutants released into the environment. Necessary equipment and materials to contain and clean up any inadvertent spills shall be maintained in the immediate work vicinity.

To minimize potentially adverse effects due to herbicide applications at the restoration sites, the following mitigation measures will be implemented:

1. All mixing and transfers of herbicides from one container to another shall be done over plastic tarp in an upland location greater than 100 yards from riparian, wetland, or river areas;
2. A spill kit containing shovels and absorbents shall be readily available to contain and soak up any leakage or spills;
3. In the event of a spill, soil contaminated with product will be immediately excavated and placed in leak-proof containers;

4. Personnel applying herbicides will be instructed on their environmental hazards, the importance of keeping the product out of and away from the river and wetlands, and will be provided with notification and containment procedures if an accidental spill occurs;
5. Empty containers shall be disposed of according to label directions and plastic bags shall be used to dispose of any waste materials in contact with herbicides;
6. To avoid consequences of overspray onto native plant species or onto water surfaces, spray activities shall be conducted on non-windy days and any herbicide application shall be ceased if windy conditions arise; and
7. Herbicide application shall not be conducted if precipitation is forecast within 72 hours and application shall be suspended for at least 24 hours subsequent to a precipitation event.

4.6 Vegetation and Aquatic Habitat

4.6.1 Affected Environment

Water diversions, flood control projects, agricultural practices, and other human activities over time have drastically changed the vegetation and aquatic habitat along the lower Truckee River (Rood et al. 2003). Historically, a lush riparian landscape occurred along the lower Truckee River. Today, the Truckee River is straighter, wider, and shallower and is not well connected to its floodplains. In addition, insufficient instream flows have contributed to degraded the riparian ecosystem, which is dependent on seasonal flow variations and floodplain inundation for water table recharge and vegetation recruitment. These conditions collectively have caused river incision and lowering of the water table, resulting in bank instability, and loss of critical wetland and riparian habitats. Consequently, the current hydrologic and hydraulic channel conditions and poorly connected floodplains at the proposed restoration sites infrequently provide suitable conditions for the natural recruitment of cottonwoods. Aquatic habitat has also been degraded due to a decline in the terrestrial and hydric vegetation, which has led to increased erosion. As a result of these conditions, wildlife in the area have suffered decreases in both population size and diversity of species.

Vegetation

Vegetation types within the three restoration project sites were mapped between June and September 2005 by the USACE as part of a planning-level delineation of aquatic resources along a reach of the lower Truckee River (Lichvar and Ericsson 2005). Vegetation types were mapped by Lichvar and Ericsson (2005) and subsequently extrapolated by North State Resources, Inc. (2008) to cover the revised project boundaries. Figures 3-1a, 3-2a, and 3-3a depict the existing vegetative community types at each of the project sites. The acreages of the existing and proposed vegetation types for each site are provided in Table 4-5 below.

Table 4-5. Existing and Proposed Acres of Vegetation Cover Types – Lower Truckee River Restoration Project

Vegetation Community	Lockwood		Mustang Ranch		102 Ranch	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Freshwater marsh						
Hardstem bulrush	0.06	0.92 ¹	0.56	5.34 ¹	0.38	2.46 ¹
Cattail	0.00	0.92 ¹	0.09	5.34 ¹	0.00	2.46 ¹
Native herbaceous						
Riparian dry	0.00	1.51	15.96	10.27	0.00	13.18
Riparian moist	0.00	0.00	1.070	0.00	0.00	0.00
Riparian wet	0.34	0.00	0.930	4.48	1.92	5.49
Non-native herbaceous						
Hairy whitetop	6.90	0.00	74.55	0.00	57.07	0.00
Fireweed	3.38	0.00	22.59	0.00	0.00	0.00
Tall whitetop	3.18	0.00	13.23	0.00	0.00	0.00
Common weeds	6.69	0.00	15.65	0.00	0.00	0.00
Tumbleweed	0.00	0.00	0.00	0.00	4.06	0.00
Native shrub						
Sagebrush	0.00	1.13	3.09	63.88	4.06	10.76
Rabbitbrush	0.00	0.00	2.09	0.00	0.00	0.00
Fremont cottonwood	0.00	0.00	0.50	0.00	12.72	0.00 ²
Narrowleaf willow	2.00	3.61	5.10	15.29	0.71	12.62
Non-native shrub						
Salt cedar	0.15	0.00	0.00	0.00	0.00	0.00
Native trees/ woodland/ forest						
Fremont cottonwood	3.87	9.61 ¹	13.46	58.11	2.66	33.39
Narrowleaf willow	0.00	9.61 ¹	0.18	1.410	0.250	25.57
Non-native trees/ woodland/forest						
Elm	4.93	2.68	0.00	0.00	0.00	0.00

¹ Acreage was split where the proposed vegetation type encompassed two existing vegetation types (e.g., the proposed freshwater marsh at Lockwood includes bulrush and cattail species).

² Lack of acreage due to proposed condition of Fremont cottonwood stands as "Native trees/woodland/forest"

Non-native herbaceous weeds are present in the Proposed Action area. Three dominant weeds identified are the hairy whitetop (*Cardaria pubescens*), tall whitetop (*Lepidium latifolium*), and fireweed (*Kochia* spp.) Other common weeds are present as well but are less prevalent. There are two types of non-native shrub species identified within the Proposed Action area: tumbleweed (*Salsola tragus*) and salt cedar (*Tamarix* spp.). These non-native plant species are becoming more prominent and are out-competing the native riparian vegetation in many areas as a result of the faltering health of the habitat.

Aquatic Habitat

The aquatic habitat within the Truckee River varies in quality and quantity through the Proposed Action area (see Figures 3-1a, 3-2a, and 3-3a). Substrate composition, presence and size of woody debris, turbulence, aquatic vegetation, terrestrial shore line vegetation, presence of undercut banks, and water depth are some of the variables that can affect aquatic habitat. These parameters are found in varying degrees among the three sites. “Cover” for fish—areas within the aquatic habitat that provide protection—is an important factor when analyzing aquatic habitat. Cover can be provided in many forms, including water depth, large and small woody debris, turbulence, terrestrial vegetation, and undercut banks. Site-specific habitat descriptions and the sum of available cover are provided for each site below:

- The aquatic habitat in the Truckee River at the Lockwood site is a simple riffle/run sequence dominated by cobble and gravel substrates. Cover ranges from 30 to 40 percent at this site and is a function of depth, large and small woody debris, turbulence, terrestrial vegetation, and some undercut banks. Riparian coverage is approximately 25 percent and is dominated by a narrow band of cottonwoods along the left and right banks of the unit. This segment of the Truckee River is entrenched an average of 3.7 feet and the erodibility of the banks is moderate (NSR 2008 and Otis Bay Ecological Consultants 2007a).
- The aquatic habitat in the Truckee River at the Mustang Ranch site is dominated by an alternating sequence of riffle and run habitat units comprised primarily of cobble and gravel substrates. Riparian habitat is limited, with a majority of the habitat units containing less than 10 percent riparian coverage. Instream cover is also limited (less than 10 percent), with the exception of the lowermost riffle unit and braided riffle complex in the middle of the project reach, where cover is provided by turbulence, large woody debris, and river depth. Bank height at the Mustang Ranch project site is characterized as exhibiting moderate erodibility. The channel within at site has entrenched an average of 4.8 feet (NSR 2008 and Otis Bay Ecological Consultants 2007a)
- The aquatic habitat in the Truckee River at the 102 Ranch project site is riffle/run habitat with substrates dominated by fine sands and silt. Similar to Lockwood and Mustang Ranch, cover and riparian habitat is limited. Stream banks, especially below the captured gravel pit, are eroding. This reach is dominated by cut banks lacking riparian vegetation, and substrate is dominated by fine sands and silt. The channel within the 102 Ranch site is entrenched an average of 3.7 feet (NSR 2008 and Otis Bay Ecological Consultants 2007a).

4.6.2 Environmental Consequences

No Action

Under the No-Action Alternative, the quality of the currently degraded native riparian and shrub plant communities would continue to decline because of the lowered water table, infrequent overbank flooding important for the recruitment and maintenance of riparian species such as Fremont cottonwood, and the presence of invasive plants. Invasive plants such as whitetop would likely continue to out-compete the native terrestrial plants and dominate the riparian corridor. The continued loss of wetland and riparian habitat would cause the wildlife resources that depend on those habitats to decline as well.

Proposed Action

The Proposed Action would benefit vegetation and wildlife resources at the three sites by restoring the basic physical and biological functionality of the river to a more natural condition. The restoration work can be expected to expand and enhance important natural habitats, which will promote an increase in biodiversity and improve ecological functions along the river. It would restore the hydrologic and soil conditions necessary for the long-term, natural regeneration of cottonwoods. Constructed wetlands and revegetated areas would support a diverse population of plant and wildlife species. Details of the proposed vegetation communities are presented in Table 4.5 above. Chapter 3 discusses the details of the restoration activities at each of the three sites.

Construction of the Proposed Action would generate short-term adverse effects on existing vegetation in the project area. Mowing in selected areas would affect both invasive and native plants. Although mowing would help control growth of invasive weeds, it may also harm native plant species in these areas, especially if the natives lack an extensive root system. Herbicides used to eliminate weeds may damage the soil by inhibiting the formation of essential mycorrhizal colonies (a symbiotic association between a fungus and the roots of a plant that increases the plant's ability to absorb minerals and water from the soil), which would disrupt the process of nutrient recycling and could affect native plant revegetation. There is also the chance that native plant species could be harmed by herbicide application as a result of over-spraying, accidental spraying, or if native plants are mixed with non-native plants selected for spraying. Construction activities could also disturb or damage vegetation communities during the movement of equipment in and around the site. To reduce invasive plant colonization of revegetated areas the restoration project will include management techniques such as seeding, containerized plantings, pole plantings, and supplemental watering that are designed to minimize weed colonization.

The riverbanks within the project area provide very limited riparian vegetation and natural features that contribute to riparian habitat. Most of the riparian habitat function within the project sites is provided by relatively young, narrow, low-density willow stands adjacent to the channel and a small number of mature cottonwood stands and galleries. Construction activities associated with the Proposed Action will result in short-term, temporary disturbances to some of this vegetation, but no permanent impacts to this habitat are anticipated.

All riparian vegetation disturbed or removed by construction activities would be replaced during an extensive post-construction revegetation effort that will recreate a larger, natural, multi-dimensional riparian plant community. At each site, there would be an overall increase in post-project riparian vegetation. While construction would result in short-term temporary effects to some riparian habitat in the project area, the Proposed Action would have long-term beneficial effects by increasing the total area of riparian vegetation, removing non-native plant communities, and allowing additional riparian communities to re-establish themselves in greater quantities.

4.6.3 Mitigation Measures

Construction at the three sites would be designed to avoid or minimize any adverse effects as much as possible. The installation of safety fencing around at-risk vegetation and existing vegetation located near the river access corridors shall be installed prior to groundbreaking activities. Appropriate mitigation measures would be used to prohibit the spread or colonization of non-native seeds. Methods such as using fill material that is free of non-native seeds and requiring that all rock and

cobble materials used be pre-washed will help prevent the introduction of invasive plant species. If straw or hay bales are used for sediment and erosion control, then the bales would be weed-free to reduce establishment or reestablishment of non-native plant species. Wash stations will be used to clean construction equipment prior to conducting work in waterways to help prevent the transport of invasive seed material downstream. Any non-native vegetation removed would be disposed of by burning or transporting to a landfill. Additionally, if necessary, any area temporarily impacted during construction would be revegetated with native species.

In order to discourage invasive weeds such as hairy whitetop, tall whitetop, and fireweed in the Proposed Action area, the methods described in the *Lower Truckee River Restoration: Re-vegetation and Weed Control Applied Methods and Best Practices Manual* (TNC 2005) will be implemented, including the following:

1. Prior to construction, tall whitetop and hairy whitetop (whitetop species) will be mowed at the early bolting stage (mid-May), allowing it to regenerate back to the early bloom stage (late June), and then sprayed with a weed herbicide and surfactant. Spraying should occur when conditions are calm and no precipitation is forecasted for several days.
2. For areas adjacent to the river and wetlands, whitetop species will be hand-pulled. Re-growth will be treated with weed herbicide using a wick applicator. Tall whitetop should be spot-treated at the late bud to early flower stage.
3. Whitetop species and other invasive perennials should be treated with herbicide prior to any revegetation efforts.
4. Where possible, weed-infested soil should be scraped away and clean topsoil should be spread over planting sites. Sites should be ripped deeply and thoroughly after scraping and before spreading.
5. Prior to replanting, remove or limit undesirable vegetation and litter.
6. The site will be monitored for new infestations of invasive weeds. Any new infestations will be controlled and, to the extent possible, eradicated in a timely manner to prevent further propagation.

Chemical contamination of the river and surrounding uplands is possible when using herbicides. To minimize potentially adverse effects due to herbicide applications at the restoration sites, the mitigation measures outlined in Section 4.4.3, Water Quality, should be implemented.

4.7 Wildlife (Non-Special-Status Species)

4.7.1 Affected Environment

Each of the three restoration sites contains a variety of vegetative communities that provide habitat to an array of wildlife species; however, these habitats have been degraded by past farming practices, livestock grazing, introduced invasive species, construction and operations of I-80 and the railroad, and USACE flood control projects on the Truckee River. The following information on the Sierran

Nevada Ecoregion and agricultural lands in the region was excerpted from the *Nevada Wildlife Action Plan* (2006).

The Sierra Nevada Ecoregion receives the greatest precipitation of any landscape in the state; the precipitation falls primarily as snow. With significant moisture, the ecoregion sustains perennial streams and the headwaters of all three of Nevada's western rivers (Truckee, Carson, and Walker). In many respects, the riparian zone associated with these streams and rivers is characterized by the same suite of plants as those of the Great Basin montane riparian areas. These riparian communities are dominated by black cottonwood, mountain alder, dogwood, and coniferous trees such as lodgepole and Jeffrey pine, and various species of tree and shrub willows. Other shrubs, such as chokecherry, bittercherry, wild rose, red elderberry, Sierra currant, and a variety of herbaceous plants, are found in the understory. Aspen stands are sometimes associated with these riparian areas, but the majority are characterized by an overstory of cottonwoods or conifers, and aspen may be only a scattered component or even entirely absent. Another key feature of Sierran Rivers and Streams is the narrowness of the riparian zone. This is a result of the underlying geology and high slope angle, which encourages rapid runoff with little movement of moisture into surrounding soils. A narrow or largely absent saturated soil zone in combination with the closed conifer overstory also results in a sparse grass and forb component in this ecological system.

Although small in extent, riparian communities in this region are critical centers of wildlife diversity (Mac 1988). More than 75 percent of the species in Nevada are strongly associated with riparian vegetation (U.S. General Accounting Office 1993), including 80 percent of the birds (Dobkin 1998). Sierran Rivers and Streams provide surface water for wildlife. Because of the presence of water either at or near the surface, riparian systems are the most productive habitats in the ecoregion. This includes production of seeds, fruits, insects, arthropods, reptiles, amphibians, fish, and vegetation for wildlife food, and often abundant vegetative growth that provides nest and den sites, cavity sites, hiding cover, and thermal cover. Riparian trees and shrubs have well developed root systems that contribute to bank stability, slowing or eliminating erosion. Riparian areas provide corridors for either long distance migration (birds, bats) or short-distance wildlife movements (deer, bobcat). By facilitating such movements, riparian corridors connect and improve the genetic health of wildlife populations. Finally, wetted backwaters along streams that receive water during high flows in the spring provide excellent habitat for frogs.

Agricultural crops are grown throughout Nevada, from 600 feet above sea level on the Fort Mohave Indian Reservation to over 7,500 feet elevation in the northern latitudes. Precipitation ranges from less than 2.75 inches in the south to close to 15 inches at higher elevations in the north, while temperatures vary from -25 °F in the north to over 110 °F in the south. Most agricultural crops are grown in valley bottoms and on alluvial deposits. Hay, either alfalfa or grass, is the primary harvested crop (76 percent of Nevada's agricultural acreage), while wheat, barley, potatoes, onions, and garlic are also grown. Nevada's Agricultural Lands contribute to wildlife conservation in three basic conditions: flooded fields, unharvested hay, and fallow fields. Flooded fields are visited by a host of bird species that feed on the invertebrates displaced (beetles, etc.) or drowned (earthworms) by the flooding. Flooded fields are particularly important in the maintenance of breeding white-faced ibis in valleys where agriculture and wetlands share prominence (e.g., Lahontan Valley, Churchill County). Unharvested hay, whether grass or alfalfa, is used by nesting birds such as long-billed curlew (*Numenius americanus*) and in some places greater sage-grouse (*Centrocercus urophasianus*).

Meadows with tall, unharvested grass serve the nesting needs of greater sandhill crane and bobolink. Fallow fields in Nevada tend to attract ground squirrel colonies and, if left undisturbed for long periods, generally experience a rodent population build-up that attracts a host of predatory raptors, including prairie falcon (*Falco mexicanus*), ferruginous hawk (*Buteo regalis*), and short-eared owl (*Asio flammeus*). After summers of drought when total acreage tends not to be planted to full capacity, the concentrations of wintering raptors in agricultural zones such as Lovelock, Mason Valley, and Lahontan Valley can be impressive. Agricultural districts have become the primary breeding habitat for Swainson's hawk (*Buteo swainsoni*) in Nevada, and the maintenance of cottonwood trees (for shade or windbreak) in agricultural lands is particularly important for the maintenance of this species.

The Proposed Action area supports deer, rabbits, and other small mammals common to western Nevada. Populations and diversity of bird species dependent on riparian habitat are decreasing while the populations and diversity of bird species associated with agricultural habitat, such as the California quail (*Callipepla californica*) and rock dove (*Columbia livia*) are increasing. The Proposed Action area is not within any of the 39 Nevada Important Bird Areas (IBAs), which are places identified as being important to bird populations for breeding, nesting, migration, and winter habitat of one or more species. While most amphibians and reptiles thrive in the arid conditions, the loss of wetland habitat has resulted in a decline of frogs and turtles (Otis Bay Ecological Consultants 2003, as cited in USACE and TNC 2005). Special-status species (i.e., federal or state listed species, BLM Sensitive species, and species protected under Executive Order 13186) may also use the Proposed Action area as habitat. These species are discussed in more detail in Sections 4.6 and 4.7.

4.7.2 Environmental Consequences

No Action

Under the No-Action Alternative, the quality of habitat at the three restoration sites would stay in its current degraded or less-than-optimal condition, and likely continue to decline. Limited cottonwood tree recruitment would likely occur in suitable areas adjacent to the river. Wildlife species more adapted to agricultural or desert habitats could increase in density, as these habitat types would become more prominent in the area. The continued loss of native wetland and limited riparian habitat would likely persist and wildlife populations would increase slowly, if at all.

Proposed Action

Wildlife in the Proposed Action area could be disturbed by noise and activity associated with the proposed construction work. Wildlife may be displaced during the mowing and manual removal of invasive weeds, particularly during the breeding season; this disturbance has the potential of resulting in bird nests being destroyed or abandoned and loss of young or eggs. However, the loss of individual nests or young is not expected to result in an adverse effect on populations of non-special-status birds (see BLM Sensitive Species below). Application of herbicides also has the potential of adversely affecting wildlife if sprays drift or contaminate the ground or if contaminated plants or water are ingested. However, this effect shall be minimized by implementing the mitigation measures outlined in Section 4.3 Water Quality.

The restored habitat is expected to support a larger population and diversity of wildlife. Any movement of wildlife away from the project area is expected to cease following construction activities.

New species not currently located at the project sites may migrate into the area. The number of frogs, turtles, and other water-dependent species would increase as newly available wetlands are colonized.

During the public scoping process, concerns were expressed that the restored wetlands proposed by the project may provide habitat for undesirable pest species, such as rodents and mosquitoes. The various restored habitats proposed by the project will support a variety of wildlife species, including some that may be considered pests by humans. The restored habitats will also support predatory species, such as raptors, that will limit rodent populations. Mosquitoes breed in pools of still water, and proposed wetland habitats may provide suitable breeding areas. However, the restored habitat would also support other insects, birds, fish, and amphibian predators that can be expected to limit mosquito populations.

4.7.3 Mitigation Measures

Land clearing and mowing would be conducted outside of the avian breeding season. If this is not possible, a qualified biologist would survey the area prior to land clearing or mowing. If nests are located or if evidence of nesting is observed, a protective buffer would be delineated and the entire area avoided, preventing the destruction or minimizing disturbance of the nest until the species are no longer active. The size of the protective buffer would depend on the habitat requirements of the particular species. Additional mitigation measures for nesting birds include:

1. Removal of potential nesting substrate (e.g., trees, shrubs) that may be affected by construction must occur between November 1 and February 28 (i.e., outside the nesting season) to ensure that active nests are not removed as a result of construction activities;
2. A minimum of one survey shall be conducted for nesting short-eared owl, western burrowing owl, sage grouse, loggerhead shrike, Lewis's woodpecker, and vesper sparrow within a 250-foot buffer around proposed construction activities by a qualified biologist. The survey may be conducted no more than one week prior to the onset of any construction activity. Active nests located within 250 feet of construction activities shall be mapped; and
3. A qualified biologist in consultation with the Nevada Department of Wildlife will determine the extent of a construction free buffer zone to be established if an active nest (a nest containing eggs or young) is found. A qualified biologist shall monitor the nest(s) to determine when the young have fledged and submit status reports to the Nevada Department of Wildlife, as appropriate, throughout the nesting season. An active nest may only be removed after the young have fledged (based on field verification).

Potential herbicide impacts to wildlife should be minimized by implementing the mitigation outlined in the Water Quality section regarding herbicide impacts.

4.8 Federally Protected Species

4.8.1 Affected Environment

Species listed under the federal Endangered Species Act as threatened and endangered which may occur in the project vicinity were identified in a letter received from the USFWS in 2006 (U.S. Fish and Wildlife Service 2006). Four species were included on this list, the endangered cui-ui, threatened

Lahontan cutthroat trout, candidate yellow-billed cuckoo (*Coccyzus americanus*), and threatened bald eagle (*Haliaeetus leucocephalus*). However, on August 8, 2007 (72 FR 37346) the bald eagle was removed from the list of federally threatened or endangered species (delisted). Thus, it is not analyzed further in this section (see also “Bald and Golden Eagle Protection Act” in Section 6.0).

Yellow-billed cuckoos appear to require large blocks of riparian habitat for nesting (U.S. Fish and Wildlife Service 2008). Suitable habitat for the species is very limited in Nevada, with most areas of cottonwood riparian forests being fragmented (U.S. Fish and Wildlife Service 2007), including the riparian corridor along the Truckee River in the project area. The riparian habitat within the project boundaries is not large or dense enough to support this species, and it has not been recorded within 5 miles of the proposed project site (Nevada Natural Heritage Program 2007). Thus, it is not analyzed further in this EA.

For those species for which generally suitable habitat was determined to be present (Lahontan cutthroat trout and cui-ui), field survey results, review of records from the Nevada Natural Heritage Database (Nevada Natural Heritage Program 2007), and pertinent literature were used to determine the likelihood of their presence in the Proposed Action area. These species are discussed below.

Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)

The Lahontan cutthroat trout (LCT) was listed as a federally endangered species in 1970 (35 FR 13520). In 1975, this designation was changed to reclassify LCT as threatened in order to facilitate management and to allow for regulated angling (40 FR 29864). In 1995, the USFWS released its recovery plan for LCT, encompassing six river basins within the historic range of LCT. Critical habitat has not been designated for this species.¹

Historically, LCT were found in a wide variety of cold-water habitats including, large terminal alkaline lakes (e.g., Pyramid and Walker Lakes), oligotrophic alpine lakes (e.g., Lake Tahoe and Independence Lake), slow meandering low-gradient rivers (e.g., Humboldt River), moderate gradient montane rivers (e.g., Carson, Truckee, Walker, and Marys Rivers), and small headwater tributary streams (e.g., Donner and Prosser Creeks) (U.S. Fish and Wildlife Service 2003). The Truckee River and its tributaries provided spawning and rearing habitat for Lahontan cutthroat trout that exhibited two distinct life history forms; lacustrine and fluvial. These forms are functionally different as they use different habitats and express different growth rates, fecundity and longevity (Bozek and Hubert 1992; Harvey and Stewart 1991).

Specific habitat requirements of LCT vary seasonally and with life stage. Like most cutthroat trout species, LCT is an obligatory stream spawner, meaning that LCT predominantly use tributary streams as spawning sites. Spawning typically occurs from April through July throughout the range of LCT, depending on stream elevation, stream discharge, and water temperature (U.S. Fish and Wildlife

¹ Critical habitat is a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. Proposed and final critical habitat designations are published in the Federal Register. Federal agencies are required to consult with the USFWS on actions they carry out, fund, or authorize to ensure that their actions will not destroy or adversely modify critical habitat. In this way, a critical habitat designation protects areas that are necessary for the conservation of the species.

Service 1995). According to Snyder (1917), depending on river flow, trout were rather common throughout the entire course of the Truckee River before the river suffered from anthropogenic effects. Seasonal increases in river flow stimulated mass movement of large trout from lakes and as river flows decreased large trout were less abundant in various reaches of the river.

The current distribution and abundance of LCT in the lower Truckee River is a function of habitat quality and quantity, presence of non-native fish species, water quality, and structural barriers to fish passage. At present, there are over 40 non-native fish species within LCT's historic range (Behnke 1992, as cited in USACE and TNC 2005). In the Sierra Nevada streams, non-native salmonids have adverse effects on the distribution and abundance of native species. The most prevalent non-native salmonids in the Truckee River are rainbow and brown trout.

Currently, there are 17 structural barriers to fish in the Truckee River between the Washoe/Highland Diversion and Pyramid Lake, which significantly limits the movement of fluvial and lacustrine forms of LCT. The current distribution of LCT is also limited by the quantity of high quality rearing and spawning habitat, much of which is restricted to higher elevation tributaries in California (U.S. Fish and Wildlife Service 2003). Derby Dam, which is approximately 3.6 miles downstream of 102 Ranch, has blocked upstream habitat passage of lacustrine LCT, resulting in an 85 percent decrease in the potential trout spawning and rearing habitat area (R. J. Behnke, cited in Coleman and Johnson 1988). Currently, the lacustrine population does not have access to enough suitable spawning habitat downstream of Derby Dam to support itself. In 2005, fall population monitoring efforts revealed few trout below Derby Dam, with densities extremely low between Derby Dam and the Sparks city limits, further evidence that suitable aquatic habitat in the Truckee River between Reno and Derby Dam is significantly limited. Monitoring also revealed that the density of all trout species increased from Reno upstream where the wild trout fishery in the Truckee River continues to thrive.

Cui-ui Sucker (*Chasmistes cujus*)

The cui-ui sucker was listed as a federally endangered species in 1967 (32 FR 4001). In 1992, the USFWS released its updated recovery plan for cui-ui. The second revision of the cui-ui recovery plan, released in 1992, provides a quantifiable recovery objective (based upon probabilistic analysis of simulated cui-ui response to various hydrologic conditions) with site-specific tasks which, if implemented, are expected to achieve recovery (i.e., eventual delisting) of cui-ui (U.S. Fish and Wildlife Service 1992). Critical habitat has not been designated for this species.

Cui-ui occupied ancient Lake Lahontan, which covered much of northwest and west-central Nevada during the Pleistocene and more recently until 5 to 10,000 years ago. Lake level declined as the climate changed, until only fragmented, remnant waters—Pyramid, Winnemucca, Walker, and Honey lakes—remained. As the deepest of these, Pyramid apparently remained permanent and, thus, continued to support cui-ui. At the beginning of the twentieth century, cui-ui inhabited Pyramid Lake and Winnemucca Lake. The species was eliminated from Winnemucca Lake when it dried in the 1930s, following unregulated diversion of water from the Truckee River and a severe drought.

Cui-ui is a large, long-lived, and omnivorous lake sucker. Cui-ui is an obligate stream spawner, congregating in March and April near the mouth of the Truckee River in Pyramid Lake. The spawning runs begin in April or May, depending upon runoff, river access, and water temperature. Spawning occurs during March and June, after which spawners return to and remain in Pyramid Lake

(U.S. Fish and Wildlife Service 1992). Although, adult cui-ui may spend up to 16 days in the river, most spawners only spend a few days. Spawning runs may continue for 4 to 8 weeks, but most fish migrate during a one to two week period (Coleman 1986).

Cui-ui predominantly spawn at night in aggregations, where females broadcast eggs over gravel dominated substrate, at depths of 0.3-1.5 feet with velocities between 0.75-2.85 feet/second (Scoppettone et al. 1983; Sigler and Sigler 1979). Fertilized eggs hatch in 1 to 2 weeks, depending upon water temperature, after which yolk-sac larvae remain in the gravel 5-10 days prior to emergence (Scoppettone et al. 1983). The optimum range for larvae is 14.4-17.2 °C; survival of newly-fertilized eggs decreases markedly in water above 17.2 °C. After the eggs hatch, yolk-sac larvae remain in the gravel 5 to 10 days prior to emergence (Scoppettone et al. 1983). Post-emergence, some fry may enter river backwaters and remain there for several weeks; however, a majority is carried by river currents into Pyramid Lake where fry occupy shallow littoral zones.

Cui-ui are now restricted to Pyramid Lake and the lower Truckee River (downstream from Derby Dam, which accounts for approximately 40 miles of the river). Adults generally use the lower 12 miles of the Truckee River only during the spawning season and only in years in which there is sufficient attraction flow for them to pass above or around the delta at the mouth of the Truckee River (Scoppettone, Coleman, and Wedemeyer 1986). Most spawners use the 10-mile reach between Marble Bluff and Numana dams, as fish passage is dependent on seasonal hydrologic conditions and operation of fishways at Marble Bluff and Numana dams. Fish passage improvements were completed by the Bureau of Reclamation at Derby Dam in 2003; however, the rock channel fish passage has not yet been placed into operation.

The regulation of Truckee River flows, in combination with restrictions on the harvest of cui-ui, hatchery supplementation programs, provision of fish passage at Marble Bluff Dam, and subsequent wet water years, has led to increasing cui-ui numbers (Rood et al. 2003). Although the fish lock at Marble Bluff Dam can easily transport the numbers of spawning cui-ui during low water years, spawning runs tend to be larger during wet, higher flow years and fish using the fish lock tend to experience crowding stress and mortality under such conditions (U.S. Fish and Wildlife Service 1992).

4.8.2 Environmental Consequences

No Action

Under the No-Action Alternative, the two federally listed fish species discussed, and their habitat, would likely remain unchanged or possibly decline as riparian vegetation diminishes, water quality and habitat degrades, and water temperatures possibly increase. Because flows in the river are highly regulated, changes in regulated flow regimes, particularly sustained increases, could result in some positive environmental effects independent of the Proposed Action, including improved cottonwood recruitment and cooler water temperatures.

Proposed Action

Direct effects occur when sensitive animal species are physically impacted by proposed project activities. Indirect effects, both positive and negative, indirectly affect sensitive animal species by causing changes in hydrology, canopy cover, and human disturbance. Effects to federally listed species are considered adverse if they result in any one of the following:

- Direct mortality;
- Loss of occupied habitat;
- Temporary impacts to habitats such that the species suffers increased mortality or lowered reproductive success;
- Permanent loss of habitat determined to be critical and/or essential to the species;
- Substantial reductions in the size of a population of the species; and/or
- Substantial reduction in the quantity or value of habitats in which federally listed populations occur.

Lahontan Cutthroat Trout

Currently, Derby Dam is the upstream limit of the lacustrine form of LCT in the Truckee River, and no significant direct or indirect effects would occur as a result of the Proposed Action. A potential exists for indirect adverse effects to lacustrine LCT downstream from the project area resulting from suspended sediment, turbidity, or petroleum contamination; however, these impacts judged to be less than significant given the distance of the project area from Derby Dam and the low probability that contaminant or suspended sediment and turbidity levels would reach chronic or acute thresholds that far downstream. Indirect effects to lacustrine LCT would include short-term temporary losses of spawning and rearing habitat and loss of riparian habitat during construction. Thus, the fluvial form of LCT is the only form of LCT subject to direct effects and indirect effects resulting from suspended sediment, turbidity, or petroleum contamination.

Injury and Mortality of Juvenile and Adult LCT

The proposed in-water construction activities (e.g., excavation of sediment plugs, installation and removal of silt curtains, redirection of the existing river channel, and riffle construction) could result in the entrapment, direct injury, or death of any juvenile or adult LCT present at the time of the work. Entrapment of adult or juvenile LCT could occur during installation of the silt curtains that are proposed for use to control turbidity during in-water construction; however, most adult and juvenile fish would likely flee from the immediate area during installation of the silt curtains. Direct injury or mortality of adult or juvenile LCT could result from abrupt impact with in-water construction equipment or installation of alluvial materials used to construct the cutover dike and construct riffle habitats. A small, temporary, but uncertain level of stranding of LCT (juvenile and adult life stages) may occur during the dewatering of the existing river channel. LCT stranded during the dewatering process would be subject to increased vulnerability to avian and terrestrial predators, increased physiological stress due to adverse water quality conditions, and ultimately mortality.

Direct injury to, or mortality of, juvenile or adult LCT could occur during in-river construction activities including riffle construction, installation and removal of silt curtains, installation of the cut-over dike, dewatering, and excavation of the sediment plugs. In channel construction activities will occur from July through September, when temperatures typically exceed chronic and acute levels, minimizing the potential for LCT to reside in the project area and reducing the potential for direct mortality to LCT.

Loss of Potential Spawning and Rearing Habitat

No permanent adverse effects to spawning or rearing habitat for LCT within the project area are anticipated. The Proposed Action would create approximately 3,117 lineal feet of riffle habitat that will include suitable sized spawning gravels and approximately 4,925 lineal feet of restored channel that will provide hydraulically diverse habitat including cover and access to the floodplain. Currently, LCT are not known to spawn in the project area and juvenile rearing is limited, given seasonally poor water quality and degraded aquatic habitat. Any potential impacts to rearing habitat, such as loss of riparian vegetation or increased suspended sediment or turbidity will be localized and temporary. The limited and localized temporary impacts on rearing habitat are expected to be offset in the long-term by beneficial increases and improved suitability of physical rearing habitat associated with implementing the Proposed Action.

Increased Turbidity and Suspended Sediment

The turbidity of a water body is related to the concentration of suspended sediment. Suspended sediment and turbidity generally do not acutely affect aquatic organisms unless they reach extremely high levels (i.e., levels of suspended sediment reaching 25 mg/L). At these high levels, suspended material can adversely affect the physiology and behavior of aquatic organisms and may suppress photosynthetic activity at the base of food webs, affecting aquatic organisms either directly or indirectly (Alabaster and Lloyd 1980). In the project area, silt and sand in the newly constructed channel could be mobilized during excavation of the earthen (or soil) plugs. Physical disturbances during construction are likely to mobilize silt and sand for a short distance downstream. These disturbances are expected to be localized and temporary and be largely restricted with the installation of silt curtains. Additionally the use of washed gravels and the cleaning of vehicle wheels prior to crossing the channel will help minimize the siltation the effects on LCT.

Any juvenile or adult LCT in the project area during the construction period could be temporarily displaced or their social behavior could be temporarily disrupted by an increase in turbidity. Behavioral disruption, even temporarily, could result in some increased vulnerability to competitive interactions or predation for juvenile salmonids (Berg and Northcote 1985). The deposit of fine sediments in food-producing riffles could reduce the abundance and availability of aquatic insects on which juvenile and adult LCT feed, and result in the loss of cover for juvenile salmonids (Bjornn and Reiser 1991); however, the existing aquatic habitat conditions are poor, and the temporary deposit of fine sediments in food-producing riffles is considered less than significant compared with the long-term benefits resulting from the Proposed Action.

Potential Spill of Hazardous Materials

The potential spill of hazardous materials (i.e., oil, grease, gasoline, and solvent) during construction and staging activities in the Truckee River could have deleterious effects on all life stages of the LCT present within close proximity to construction activities. Without rapid containment and clean up, these materials could be toxic, depending on the location of the spill in proximity to surface water features. Incubating fry would be at greatest risk due to their limited mobility and the physiological kinetics of toxicant metabolism; however, LCT is not currently known to spawn in the project area and incubating fry would not be present. Juvenile and adult fish exhibit a greater level of mobility and thus possess a greater ability to avoid potentially hazardous materials.

Cui-ui Sucker

Currently cui-ui suckers are limited to the reach of the Truckee River downstream of Derby Dam (approximately 3.6 miles downstream of 102 Ranch); therefore, cui-ui is not subject to direct effects as they are not currently present in the project area. The potential for indirect effects resulting from suspended sediment, turbidity, or petroleum contamination effects are less than significant given the proximity of the project area to the known range of cui-ui and the very low probability that contaminant or suspended sediment and turbidity levels would reach chronic or acute thresholds that far downstream.

Loss of Potential Spawning and Rearing Habitat

No permanent adverse effects to spawning or rearing habitat for cui-ui within the project area are anticipated. Currently, cui-ui do not spawn in the project area; however, if the fish passage facilities at Derby Dam were operated, cui-ui could potentially spawn and rear in the project area. Any potential impacts to potential spawning or rearing habitat, such as loss of riparian vegetation or increased suspended sediment or turbidity will be localized and temporary; these impacts are expected to be offset in the long-term by beneficial increases and improved suitability of physical rearing habitat associated with the Proposed Action. No permanent impacts are anticipated.

Benefits will accrue from the engineered improvements of floodplain connection to the river, channel migration through the upper elevation floodplain, and revegetation of the rehabilitated floodplain with native plant species; these improvements will eventually contribute shade and large wood to the river channel, and allow for a greater abundance of different hydraulic habitats to form. A high diversity of hydraulic habitats generally translates into a system with a high diversity of aquatic organisms and is often characterized as high quality habitat for salmonids.

The riverbanks within the Proposed Action area provide very limited riparian vegetation with the natural features that contribute to riparian habitat. Construction activities associated with the Proposed Action will result in short-term, temporary disturbances to some of this vegetation, but no permanent impacts to this existing habitat will occur.

4.8.3 Mitigation Measures

The following mitigation measures will be implemented for the Lahontan cutthroat trout and cui-ui sucker.

Injury and Mortality of Juvenile and Adult LCT

The following mitigation measures will be implemented to minimize injury and mortality of juvenile and adult fish for LCT during all in channel work including, but not limited to, construction of riffle habitat, excavation of earthen or soil plug, construction of the cut-over dike, and installation and excavation of the silt curtains.

1. In-water work may occur from July through September as water temperatures and dissolved oxygen levels during this period are typically unsuitable for LCT and they would not be expected to be in this reach of the river during this season.

2. No in-water construction and stream diversion actions during the spring migration (April to July).
3. Equipment shall be operated slowly and deliberately to minimize potential injury and mortality of juvenile and adult fish during excavation and placement of fill materials within the active channel. The contractor shall be instructed that before submerging an excavator bucket, or placing fill gravel below the water surface, the excavator bucket or equipment will be operated to “tap” the surface of the water.
4. Dewatering of the existing channel will be conducted slowly and deliberately to allow fish salvage operations and prevent the mortality of juvenile or adult LCT. A qualified fishery biologist shall be present to safely capture and relocate any LCT remaining in the existing channel. The fish will be immediately relocated to a suitable location outside of the project area using accepted fishery techniques to reduce stress and safely relocate juvenile or adult LCT and any other additional fish species.
5. Conduct appropriate special status species surveys prior to the commencement of construction in order to avoid adverse effects to listed species and species of concern.

Increased Turbidity and Suspended Sediment

The construction site management measures outlined in the Water Quality section shall be implemented to avoid and minimize the potential for adverse effects of turbidity or suspended sediment during in-water and upland construction to the LCT and cui-ui.

Potential Spill of Hazardous Materials

Construction specifications shall include the measures outlined in the Water Quality section to reduce potential impacts associated with accidental spills of pollutants (e.g., fuel, oil, grease, etc.).

4.9 BLM Special-Status Species

4.9.1 Affected Environment

Sensitive Species

BLM Sensitive species are those designated by a State Director, usually in cooperation with the State agency responsible for managing the species and State Natural heritage programs, as sensitive. They are those species that: (1) could become endangered in or extirpated from a State, or within a significant portion of its distribution; (2) are under status review by the USFWS and/or National Marine Fisheries Service; (3) are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution; (4) are undergoing significant current or predicted downward trends in population or density such that federal listed, proposed, candidate, or State-listed status may become necessary; (5) typically have small and widely dispersed populations; (6) inhabit ecological refugia or other specialized or unique habitats; or (7) are State-listed but which may be better conserved through application of BLM sensitive species status.

It is BLM policy to provide sensitive species with the same level of protection that is given federal candidate species. The major objective of this protection is to preclude the need for federal listing (BLM 2003). A list of BLM Sensitive Species potentially occurring in the region was obtained (June

2007) from the BLM Carson City Field Office. Some of the species on this list are not present in the Proposed Action area because there is no suitable habitat onsite or because the project exists outside of the species' known range. For those species for which generally suitable habitat was determined to be present, field survey results, review of records from the Nevada National Heritage Database (Nevada Natural Heritage Program 2007), and pertinent literature were used to determine the likelihood of their presence in the Proposed Action area.

Table 4.5 presents BLM Sensitive species that may be affected by project implementation; however, the negative effects experienced by these species are expected to not be significant if project BMPs and identified mitigation measures are implemented.

Table 4-5. BLM Sensitive Species Potentially Occurring in the Proposed Action Area – Lower Truckee River Restoration Project

Common Name (Scientific Name)	General Habitat Description	Potential for Occurrence
California floater (<i>Anodonta californiensis</i>)	Freshwater lakes and lake-like stream habitats with fish.	May be Present. Truckee River provides suitable habitat.
Wong springsnail (<i>Pyrgulopsis wongi</i>)	Freshwater lakes, reservoirs, rivers, streams, etc.	May be Present. Truckee River provides suitable habitat.
Northern leopard frog (<i>Rana pipiens</i>)	Shoreline cover, submerged and emergent aquatic vegetation; cattail and sedge marshes, weedy ponds; 0-7,000 feet.	May be Present. Suitable habitat is limited; however, the species is known to occur in the Truckee River in the vicinity of McCarran Ranch.
Sierra alligator lizard (<i>Elgaria coerulea palmeri</i>)	Woodland and forest landscapes, grassland and brush habitat.	May be Present. Suitable habitat is present and the species has been recorded within 5 miles (Nevada Natural Heritage Program 2007).
Golden eagle (<i>Aquila chrysaetos</i>)	Occurs primarily in mountainous canyon land, rimrock terrain of open desert and grassland areas.	Absent as Breeder. Suitable nesting habitat not present. May occur as a forager.
Short-eared owl (<i>Asio flammeus</i>)	Large expanses of prairie and coastal grasslands, heathlands, shrub-steppe, and tundra.	May be Present. Shrub community provides suitable breeding and foraging habit.
Western burrowing owl (<i>Athene cunicularia hypugea</i>)	Open grasslands and shrublands with perches and burrows.	May be Present. Suitable breeding and foraging habitat present.
Sage grouse (<i>Centrocercus urophasianus</i>)	Closely associated with sagebrush ecosystems. Adapted to a mosaic of sagebrush habitats.	May be Present. Shrub community provides suitable breeding and foraging habitat.
Vaux's swift (<i>Chaetura vauxi</i>)	Forages over grasslands and water.	Absent as Breeder. Species does not breed in the area but may occur as a rare migrant.

Table 4-5. BLM Sensitive Species Potentially Occurring in the Proposed Action Area – Lower Truckee River Restoration Project

Common Name (Scientific Name)	General Habitat Description	Potential for Occurrence
Black tern (<i>Chlidonias niger</i>)	Shallow freshwater marshes with emergent vegetation, occasionally river or island edges.	Absent as Breeder. Species does not breed in the area, but freshwater marshes provide suitable habitat for migrating birds.
Merlin (<i>Falco columbarius</i>)	Wintering habitat includes open forests and grasslands.	Absent as Breeder. Species does not nest in the project region, but may occur as a migrant.
Prairie falcon (<i>Falco mexicanus</i>)	Primarily associated with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas; requires ledges on rocky outcrops or cliffs for nesting.	Absent as Breeder. Suitable breeding habitat is not present in the Proposed Action area; however, the species may occur in the project area as a forager.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Open habitats with sparse shrubs and trees, other suitable perches, bare ground and low or sparse herbaceous cover.	May be Present. Shrub community provides suitable breeding and foraging habitat.
Lewis's woodpecker (<i>Melanerpes lewis</i>)	Open riparian woodland dominated by cottonwood, pinyon pine-juniper forests, and ranchland.	May be Present. Riparian community provides suitable breeding and foraging habitat.
Osprey (<i>Pandion haliaetus</i>)	Ocean shorelines, lake margins, and large, open river courses for both nesting and wintering habitat.	Absent as Breeder. Species is not known to breed in the area but may forage in the area.
Vesper sparrow (<i>Poocetes gramineus</i>)	Breeds in dry, open habitats with short, sparse, and patchy herbaceous vegetation; some bare ground; and low to moderate shrub or tall forb cover.	May be Present. Shrub community provides suitable breeding and foraging habitat are present.
Pallid bat (<i>Antrozous pallidus</i>)	Prefers rocky outcrops, cliffs, and crevices with access to open habitats for foraging; day roosts are in caves, crevices, mines, and occasionally in tree hollows and buildings; night roosts may be in more open sites, such as porches and open buildings.	May be Present. Suitable roosting and foraging habitat is present.
Pygmy rabbit (<i>Brachylagus idahoensis</i>)	Sagebrush, bitterbrush, and pinyon-juniper habitats; associated with tall, dense, large-shrub stages of big sagebrush, greasewood, and rabbitbrush.	May be Present. Suitable habitat is present.
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	Prefers mesic habitats; gleans from brush or trees or feeds along habitat edges; requires caves, tunnels, mines, buildings, or other human-made structures for roosting.	Absent as Breeder. Suitable roosting/breeding habitat is not present; however the species has been recorded within 5 miles of the Proposed Action area (Nevada Natural Heritage Program 2007) and may forage over the sites.

Table 4-5. BLM Sensitive Species Potentially Occurring in the Proposed Action Area – Lower Truckee River Restoration Project

Common Name (Scientific Name)	General Habitat Description	Potential for Occurrence
Big brown bat (<i>Eptesicus fuscus</i>)	Prefers to forage over open areas, water sources, or among trees in fairly open stands; uses buildings and other human-made structures for roosting to such an extent that natural roosting habits are poorly known.	Absent as Breeder. Suitable roosting/breeding habitat is not present; however, the species may forage over the sites.
Spotted bat (<i>Euderma maculatum</i>)	Prefers sites with adequate roosting habitat, such as cliffs; feeds over water and along washes; occasionally found in caves and buildings; cliffs provide optimal roosting habitat.	Absent as Breeder. Suitable roosting/breeding habitat is not present; however, the species may forage over the sites.
Hoary bat (<i>Lasiurus cinereus</i>)	Prefers open habitats or habitat mosaics with access to trees for cover and open areas or habitat edges for feeding; generally roosts in dense foliage of medium to large trees in sites hidden from above, with few branches below.	May be Present. Suitable roosting and foraging habitat is present.
California myotis (<i>Myotis californicus</i>)	Prefers rock-walled canyons with open water, open woodlands, and forests, or brushy habitats for foraging; typically a crevice-roosting species in buildings, under bark, and in caves and mines.	May be Present. Suitable roosting and foraging habitat is present.
Western small-footed myotis (<i>Myotis ciliolabrum</i>)	Most common in pinyon-juniper forests. It also occurs in deserts, chaparral, riparian zones, and western coniferous forest. Roosts in cliff and rock crevices, buildings, concrete overpasses, caves, and mines.	Absent as Breeder. Suitable roosting/breeding habitat is not present; however, the species may forage over the sites.
Long-eared myotis (<i>Myotis evotis</i>)	Feeds along habitat edges, in open habitats, and over water; roosts in buildings, crevices, spaces under bark, and snags; caves are used primarily as night roosts.	May be Present. Suitable roosting and foraging habitat is present.
Little brown bat (<i>Myotis lucifugus</i>)	Prefers to feed over water or open habitats; roosts in buildings, trees, under rocks or wood, or occasionally in caves; fairly common in sagebrush, bitterbrush, alkali desert scrub, wet meadow, and montane chaparral.	May be Present. Suitable roosting and foraging habitat is present.
Fringed myotis (<i>Myotis thysanodes</i>)	Uses open habitats, early successional stages, streams, lakes, and ponds as foraging areas; roosts in caves, mines, buildings, crevices, and snags.	May be Present. Suitable roosting and foraging habitat is present.

Table 4-5. BLM Sensitive Species Potentially Occurring in the Proposed Action Area – Lower Truckee River Restoration Project

Common Name (Scientific Name)	General Habitat Description	Potential for Occurrence
Long-legged myotis (<i>Myotis volans</i>)	Feeds over water and over open habitats, using denser woodlands and forests for cover and reproduction; roosts in rock crevices, buildings, under tree bark, and in snags, mines, and caves.	May be Present. Suitable roosting and foraging habitat is present.
Yuma myotis (<i>Myotis yumanensis</i>)	Distribution is closely tied to bodies of water, which it uses as foraging sites and sources of drinking water; open forests and woodlands are optimal habitat; roosts in buildings, mines, caves, or crevices; also seen roosting in abandoned swallow nests and under bridges.	May be Present. Suitable roosting and foraging habitat is present.
Western pipistrelle (<i>Pipistrellus hesperus</i>)	Prefers rocky canyon walls and cliffs in arid habitats; roosts primarily in rock crevices, occasionally in mines and caves, and rarely in buildings; often found foraging over water, in rocky canyons, and along cliff faces.	Absent as Breeder. Suitable roosting/breeding habitat is not present; however, the species may forage over the sites.
Brazilian free-tailed bat (<i>Tadarida brasiliensis</i>)	Uses caves, crevices, and buildings for cover, foraging high over surrounding habitats and water; requires caves, mine tunnels, crevices, or buildings for roosting and hibernation.	Absent as Breeder. Suitable roosting/breeding habitat is not present; however, the species may forage over the sites.
River otter (<i>Lontra canadensis</i>)	Cover provided by thickets, tall wetland plants, hollow logs, stumps, snags, and burrows and other cavities	May be Present. Truckee River and adjacent riparian provide suitable habitat.

Migratory Birds

On January 11, 2001, President Clinton signed Executive Order 13186 (Land Bird Strategic Project) placing emphasis on conservation and management of migratory birds. These species are not protected under the Endangered Species Act, but most are protected under the Migratory Bird Treaty Act of 1918. BLM management for these species is conducted pursuant to Instruction Memorandum (IM) 2008-050 (December 18, 2007). Species of conservation concern in the proposed project region are listed in Table 4-6.

Game Species

On August 16, 2007, President George Bush signed Executive Order 13443 (Facilitation of Hunting Heritage and Wildlife Conservation), which directs federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

The proposed project complies with this order. Restoration of the lower Truckee River and associated habitats will improve recreational opportunities, including hunting where legal, on and adjacent to the proposed project sites. The Truckee River is outside all Sage Grouse Population Management Units; however, the Pah Rah Population Management Unit is located immediately to the north of the Truckee River. Proposed restoration activities would be anticipated to have only positive effects on sage grouse, as well as other game species, such as mule deer, pronghorn, and black bear. Bird species of conservation concern in the proposed project region are listed in Table 4-6.

Table 4-6. Migratory and Game Birds of Conservation Concern in the Project Region

Migratory Birds of Conservation Concern		
Greater sage grouse (<i>Centrocercus urophasianus</i>)	Tricolored blackbird (<i>Agelaius tricolor</i>)	Northern harrier (<i>Circus cyaneus</i>)
American avocet (<i>Recurvirostra americana</i>)	Ferruginous hawk (<i>Buteo regalis</i>)	Olive-sided flycatcher (<i>Contopus cooperi</i>)
American bittern (<i>Botaurus lentiginosus</i>)	Swainson's hawk (<i>Buteo swainsoni</i>)	Peregrine falcon (<i>Falco peregrinus</i>)
Bendire's thrasher (<i>Toxostoma bendirei</i>)	Golden eagle (<i>Aquila chrysaetos</i>)	Prairie falcon (<i>Falco mexicanus</i>)
Black-throated gray warbler (<i>Dendroica nigrescens</i>)	Gray vireo (<i>Vireo vicinior</i>)	Pinyon jay (<i>Gymnorhinus cyanocephalus</i>)
Virginia's warbler (<i>Vermivora virginiae</i>)	Lewis's woodpecker (<i>Melanerpes lewis</i>)	Pygmy nuthatch (<i>Sitta pygmaea</i>)
Brewer's sparrow (<i>Spizella breweri</i>)	White-headed woodpecker (<i>Picoides albolarvatus</i>)	Red-naped sapsucker (<i>Sphyrapicus nuchalis</i>)
Sage sparrow (<i>Amphispiza belli</i>)	Loggerhead shrike (<i>Lanius ludovicianus</i>)	Williamson's sapsucker (<i>Sphyrapicus thyroideus</i>)
Flammulated owl (<i>Otus flammeolus</i>)	Long-billed curlew (<i>Numenius americanus</i>)	Willet (<i>Catoptrophorus semipalmatus</i>)
Burrowing owl (<i>Athene cunicularia</i>)	Mountain plover (<i>Charadrius montanus</i>)	Wilson's phalarope (<i>Phalaropus tricolor</i>)
Short-eared owl (<i>Asio flammeus</i>)	Snowy plover (<i>Charadrius alexandrinus</i>)	Yellow-billed cuckoo (<i>Coccyzus americanus</i>)
Spotted owl (<i>Strix occidentalis</i>)	Northern goshawk (<i>Accipiter gentilis</i>)	

Table 4-6. Migratory and Game Birds of Conservation Concern in the Project Region

Game Birds of Conservation Concern		
Canvasback (<i>Aythya valisineria</i>)	Wood duck (<i>Aix sponsa</i>)	Northern pintail (<i>Anas acuta</i>)
Mourning dove (<i>Zenaida macroura</i>)	Mallard (<i>Anas platyrhynchos</i>)	
Ring-necked duck (<i>Aythya collaris</i>)	Band-tailed pigeon (<i>Columba fasciata</i>)	

4.9.2 Environmental Consequences

No Action

Under the No-Action Alternative, the majority of the species identified in Tables 4-5 and 4-6 would likely decline in numbers because they require habitat features that would likely continue to become degraded and marginalized. Because many of these species use water as an important component of their life cycle, the quality and quantity of water is important. It is unlikely that water quality would improve with the No-Action Alternative. No Action would likely result in continued erosion of riverbanks, which could contribute to the further degradation of remaining riparian habitat and increased suspended sediment in the water column. Additionally, water quality may decline as a result of continued municipal, industrial, and agricultural uses. Because the river flow regime is highly regulated, increases or decreases in water quantity are possible.

Proposed Action

Under the Proposed Action, the species identified in Tables 4-5 and 4-6 above would generally benefit from river and ecological restoration. While adverse effects may occur to individual birds and other species, no significant adverse effects would be expected to accrue to populations, nor would the Proposed Action create trends toward the listing of species as threatened or endangered. The creation of variable habitats, such as wetlands, grasslands, and the shrub and woodland areas, for example, would benefit the majority of the species discussed. Improved ecosystem complexity and river health would also benefit wildlife.

Expected impacts to these species would be temporary and are primarily related to construction-related activities. All impacts to the specified species are expected to be minimal if all BMPs and mitigation measures are implemented. Activities such as vegetation removal can negatively affect individuals of sensitive bird species if conducted indiscriminately or at the wrong time of year. Accidental spills of hazardous materials can have detrimental effects on wildlife, and impacts to aquatic species can occur if excessive sediment enters the water column. Mitigation measures to avoid and/or minimize these potentially adverse effects are provided below.

The Proposed Action area provides suitable roosting habitat (e.g., snags, trees with loose bark) for BLM Sensitive bat species. Thus, the removal of large trees, especially those with hollows or loose bark, could result in the direct loss of individual bats. However, due to the lack of caves, mines,

tunnels, and other potential colony sites, the Proposed Action would not result in the elimination of an entire colony (a potentially significant impact) through the loss of a group hibernaculum or maternity colony. Nevertheless, noise and visual disturbances associated with construction activities may disrupt bats roosting in or directly adjacent to the site. However, the species are expected to return to the area after construction is completed. Further, the proposed restoration and enhancement activities are expected to increase the quality of the foraging habitat and the quality and quantity of the species' prey base.

Some construction impacts to suitable habitat for the species listed in Tables 4-5 and 4-6 may occur during project construction. However, due to the abundance of similar habitats in the immediate vicinity of the Proposed Action area, the temporary loss of suitable habitat resulting from project implementation is not expected to affect significantly the above-listed species. Further, mitigation measures outlined in Section 4.4 Vegetation and Aquatic Habitat would reduce potential effects to sensitive habitats.

4.9.3 Mitigation Measures

The following mitigation measures will be implemented to avoid or reduce impacts to special-status species and migratory birds.

1. Land clearing and mowing will be conducted outside of the avian breeding season if feasible. If this is not possible, a qualified biologist shall conduct a minimum of one survey for nesting special-status birds within a 250-foot buffer around proposed construction activities. The survey may be conducted no more than one week prior to the onset of any construction activity. Active nests located within 250 feet of construction activities shall be mapped; and a qualified biologist in consultation with the Nevada Department of Wildlife and/or BLM as appropriate will determine the extent of a construction free buffer zone to be established. A qualified biologist shall monitor the nest(s) to determine when the young have fledged and submit status reports to the Nevada Department of Wildlife and/or BLM as appropriate, throughout the nesting season. An active nest may only be removed after the young have fledged (based on field verification).
2. If vegetation is to be removed and all necessary approvals have been obtained, potential nesting substrate (e.g., trees and shrubs) that will be affected by construction may be removed between November 1 and February 28 (i.e., outside the nesting season) to minimize the potential for active nests to be disturbed as a result of construction activities.
3. Potential impacts to wildlife from herbicide use, spills of hazardous materials, and sedimentation shall be minimized by implementing the mitigation outlined in Section 4.3 Water Quality.

4.10 Cultural Resources

4.10.1 Affected Environment

A cultural resources field investigation and inventory was conducted for the Proposed Action area under the direction of BLM by the Chambers Group, Inc. (Chambers Group 2007). Fieldwork was conducted in March 2007, and the inventory covered a total of approximately 695 acres at the

Lockwood, Mustang Ranch, and 102 Ranch sites. The final report was accepted by BLM in October 2007 and received concurrence from the Nevada State Historic Preservation Office (SHPO) in November 2007. Subsequently, supplemental field investigations were conducted by BLM staff to cover additional areas not part of the original survey, including the former residential parcel at Lockwood site which was acquired by Washoe County. Prior to these investigations, previous cultural resource studies were conducted in association with the McCarran Ranch restoration project (USACE/USFWS and Speulda 2001). Collectively, these cultural resource investigations provide full coverage of the entire Proposed Action area.

Prehistory

Archaeological researchers have defined the region's prehistory in terms of four chronological intervals, generally based on the adaptive strategies of the prehistoric populations: the Pre-Archaic (11,000 to 8,000 years before present [B.P.]), Early Archaic (8000 to 4000 B.P.), Middle Archaic (4000 to 1500 B.P.), and the Late Archaic (1500 to European Contact/500 B.P.) (Chambers Group 2007).

The Pre-Archaic period is characterized by highly mobile foragers who focused on lake and marsh resources (Elston 1986 cited in Chambers Group 2007) and hunted large animals over broad areas. The Early Archaic period is marked by a shift to less mobile settlement systems and higher population densities. Evidence of the Pre- and Early Archaic period near the project area is relatively sparse and generally consists of various types of projectile point types, with grinding equipment and other artifacts appearing later in the record.

The Middle Archaic period is characterized by a more variable environment and the use of uplands and mountainous terrain; in the Lahontan Basin, archaeological sites appear to have been occupied more intensively, marked by the appearance of a distinctive style of basketry and other suggestions of seed collection and processing. Village-like "base camps" were occupied at the mouth of the Truckee River, with continued exploitation of lacustrine resources. The Late Archaic period is marked by a shift, possibly resulting from population pressure, to a focus on small game, fish, and plant foods, as well as the introduction of the bow and arrow. During the Late Archaic period, villages at the mouth of the Truckee River continued to be used, although structures were apparently smaller (Chambers Group 2007).

Ethnography

Humans have inhabited the Lake Tahoe, Truckee River, and lower Carson River basins for more than 10,000 years. These early people depended on the abundant fish in the Truckee River, Pyramid Lake, and Stillwater Marsh for survival. In particular, the cui-ui, a sucker fish found only in Pyramid Lake and the lower Truckee River, was a staple for people in this region. The project area is located in the overlapping ethnographic territory between the Washoe and the Northern Paiute. Evidence shows that these groups interacted within the region (Pendleton et al. 1982 cited in Chambers Group 2007), and, as a result, intermarriage and bilingualism occurred (Chambers Group 2007).

Washoe

The Washoe occupied an area loosely centered on what is now known as Lake Tahoe and were linguistically distinct from other ethnographic groups in the Great Basin; the anomaly of their

language suggests that the Washoe have resided in the Great Basin much longer than other groups (Jacobson 1986 cited in Chambers Group 2007). They were traditionally divided into three groups based on geographic location (ITCN cited in Chambers Group 2007); the “northerners” occupied the area in what is now known as Honey Lake, Sierra Valley, Truckee-Donner Lake, Truckee Meadows, Washoe Valley, and Eagle Valley.

The Washoe were unusual among other neighboring tribes in that they maintained permanent camps while also using seasonal, temporary camps (d’Azevedo 1986 cited in Chambers Group 2007). Two basic types of houses were built: a sturdy, conical or round-shaped winter home and a simpler, dome-shaped summer home (d’Azevedo 1986 and ITCN 1976 cited in Chambers Group 2007).

The Washoe gathered plant foods; pine nuts and acorns (gathered on the other side of the mountains, near the present-day cities of Colfax and Auburn, California) provided staple crops. Fish were also an important food source due to their abundance and availability. In addition to pine nuts and acorns, the Washoe collected and used a wide variety of plants for food, medicine, and subsistence purposes. Fish, which were plentiful and easily available, were an important food source; fish were cooked and eaten fresh, as well as dried and stored for winter months (d’Azevedo 1986 and ITCN 1976 cited in Chambers Group 2007). Deer and rabbit were hunted by the Washoe (ITCN 1976 cited in Chambers Group 2007). Other animals hunted include antelope, porcupine, beaver, groundhog, chipmunk, gopher, squirrel, woodchuck, badger, mouse, rat, and shrew (d’Azevedo 1986 and ITCN 1976 cited in Chambers Group 2007); a variety of birds were also hunted. Hunting techniques varied, depending on the type of game. Bone hooks, willow spears with bone points, conical baskets with funnel-shaped entrances, and fish nets were used for fishing, while bows, and arrows, snares, and hunting blinds were used for hunting.

Northern Paiute

The Northern Paiute occupied a territory of approximately 70,000 square miles (Fowler and Liljebld 1986 cited in Chambers Group 2007) from the western perimeter of the Great Basin, following the Sierra Nevada, and continuing north to the Columbia/Snake River Plateau. Subgroups were distinct both culturally and politically, although all spoke the same language (Chambers Group 2007). The Pyramid Lake Paiutes were called “Kuyuidikadi” or “cui-ui eaters” (Dept. of the Interior and California DWR 2007; also noted in Fowler and Liljebld 1986 cited in Chambers Group 2007).

Within the Northern Paiute’s territory were a variety of resources (including the fish in Pyramid Lake), and the people lived a seasonal, semi-nomadic existence, with families reuniting in larger camps during winter (Steward and Wheeler-Voegelin 1974 cited in Chambers Group 2007). Locations along the Truckee River have been identified as important to the Northern Paiute for access to riverine resources. The sites along the river provided short-term camps as the Northern Paiute traveled to multiple locations for fishing, gathering, and hunting.

Given the ecological diversity of their large territory, the Northern Paiute relied on hunting, plant gathering, and fishing in various areas according to season for subsistence. Groups centered on lakes and rivers to take advantage of the abundant fisheries, and fishing was a year-round subsistence activity. Spawning runs provided occasions for food gathering as well as socializing and ceremonials (Hittman 1984 cited in Chambers Group 2007). The Northern Paiute caught various kinds of fish, and the tools and techniques varied accordingly and included gill nets, hooks and lines, spears, and

harpoons (Fowler and Liljeblad 1986 and Steward 1941 cited in Chambers Group 2007). The Northern Paiute also hunted a wide variety of game using bows, arrows, traps, and corrals with the arrow tips made of stone, bone, or wood. Animals hunted included waterfowl and other birds, coyote, desert fox, deer, mountain lion, antelope, bear, rabbit, marmot, porcupine, and squirrel.

Historic Overview

The first Euroamericans to enter northern Nevada were fur trappers in the late 1820s and early 1830s; immigrant parties crossed through the region in the 1840s (Chambers Group 2007). The area was not systematically explored until John Charles Fremont, who was exploring the Rocky Mountains and northwest, arrived from Oregon Territory with guide Kit Carson (Dept. of the Interior and California DWR 2004) while the territory was owned by Mexico. Fremont encountered Pyramid Lake and the lower Truckee River in January of 1844. They traveled through the area that would become Sparks and Reno and continued southwest where they found Lake Tahoe. Later the same year, the Stevens-Murphy-Townsend Party arrived in the region after traveling west from Iowa; after leaving the Humboldt Sink, the party encountered the Truckee River, which supposedly they named after a Paiute guide (Chambers Group 2007). Two years later, the Donner Party traveled this same route along the Truckee River. After the discovery of gold in California in 1848, the flow of emigrants along Truckee River increased considerably (Chambers Group 2007).

In 1849, an estimated 22,500 settlers traveled through Truckee Meadows and along the Truckee River on their way to California. In 1850, the number rose to 45,000 settlers, and, in 1852, 52,000 settlers answered the call of the Gold Rush (Nevada Timeline 2003, cited in USACE and TNC, June 2005). The earliest settlement in the Truckee Meadows was in 1852 by H. H. Jamison who moved north with trade goods, which later provided goods to emigrants who traveled through the Truckee Meadows. During the mid-1860s, development within Truckee Meadows cultivated with the establishment of two stores, a hotel, a market, a blacksmith shop, saloons, and post office (Paier 1970 cited in Chambers Group 2007). The completion of the transcontinental railroad in 1869 through the lower Truckee Canyon provided easy access for homestead and cash entry purchases.

Ranching and farming played a prominent role in the development and settlement of western Nevada. Most farms and ranches were established along the banks of rivers to guarantee a sufficient supply of water, with the remaining areas only supporting seasonal grazing. For example, in 1869, James Clark purchased 160 acres located within the 102 Ranch parcel of the project area. Clark's ranch became known as the 102 Ranch which later was used as a source for gravel for many decades (Castor 1995 cited in Chambers Group 2007). Alfalfa was introduced in the Truckee Meadows and became a principal cash crop by the 1870s. The second highest cash crop was potatoes (Townley 1983 cited in Chambers Group 2007). The need for irrigation systems to develop fertile grazing lands became significant throughout the Truckee Meadows.

In 1935, the Truckee River Agreement was entered by the United States, the Truckee-Carson Irrigation District, the Sierra Pacific Power Company, and the Washoe County Water Conservation District for the conservation and control of flood waters and uses of the river (Horton 1997 cited in Chambers Group 2007). In 1950, major flooding and property damage occurred in Reno and the Truckee Meadows,. In response, the Washoe Project was designed by Reclamation to improve the regulation of runoff through the construction of additional upstream reservoir sites on both the

Truckee River and Carson River to serve agricultural needs, provide for the development of hydropower, fishery uses, flood protection, fish and wildlife benefits, and recreation development.

In December 1955, the Truckee Meadows experienced another devastating flood, resulting in the passing of the Washoe Project Act by Congress. As a result of the Washoe Project, the Prosser Creek Dam and Reservoir, Stampede Dam and Reservoir and Marble Bluff Dam and Pyramid Lake Fishery were built (Horton 1997 cited in Chambers Group 2007). Newly constructed modifications along the lower Truckee River were exposed to another major flood event in 1963, resulting in major erosion (Chambers Group 2007).²

Indian Trust Assets and Related Concerns

Indian trust assets are legal interests in property or natural resources held in trust by the United States for Indian tribes or individuals. The Secretary of the Interior (Secretary) is the trustee for the United States on behalf of Indian tribes. All Department of the Interior bureaus share the Secretary's duty to act responsibly to protect and maintain Indian trust resources reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and Executive Orders. These rights are sometimes further interpreted through court decisions and regulations. Examples of trust resources are lands, minerals, hunting and fishing rights, and water rights. The Department of the Interior carries out its activities in a manner that protects trust resources and avoids adverse impacts when possible. When adverse impacts cannot be avoided, appropriate mitigation or compensation is to be provided in consultation with the affected tribes and/or individuals (Dept. of the Interior and California DWR 2004).

For the purposes of this EA, this section addresses the lead agencies' management of Indian trust assets along with other Indian resources and issues, collectively termed "concerns," pursuant to a number of statutes, regulations, Executive Orders (EO), Secretarial Orders, policies, and agreements. For example, the American Indian Religious Freedom Act (AIRFA) directs federal agencies to evaluate their policies and procedures to ensure the right of freedom for Native people to exercise their traditional religions, including the rights of access to religious sites, use and possession of sacred objects, and freedom to worship through traditional ceremonies; the Act is also intended to ensure that rites are not disrupted by agency practices. EO 13007 directs federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. Reclamation's Indian Policy affirms that Reclamation will comply with both the letter and the spirit of federal laws and policies relating to Indians, acknowledge and affirm the special relationship between the United States and federally recognized tribes, and actively seek partnerships with tribes to ensure that they have the opportunity to fully participate in Reclamation's programs in developing and managing water and related resources. (See also Section 6.0.)

In the vicinity of the Proposed Action, Indian trust assets and concerns include, but are not necessarily limited to, land, water quality, water rights, fisheries, native plants, wildlife resources, and cultural sites. These resources are important for both cultural, traditional practice, and financial reasons. The

² A detailed chronology of Truckee River history ("A Chronological History of Lake Tahoe and the Truckee River and Related Water Issues") is available from the State of Nevada Department of Conservation and Natural Resources Division of Water Resources (Nevada DCNR 1997). Available on the Internet at: <http://water.nv.gov/water%20planning/truckee/trchrono.htm>.

propagation, protection, and gathering of native plant species by traditional Native cultural practitioners is an important concern for the PLPT, Washoe Tribe, and the Colony. In addition, the Pyramid Lake fishery remains one of the cultural mainstays of PLPT, and obtaining increased inflow to Pyramid Lake is an important concern. To protect the local fisheries, the PLPT tribal fisheries program operates two hatcheries (Sutcliffe and Numana) and is working cooperatively with federal, state, and private agencies to protect spawning areas and improve river access for spawning. PLPT hatcheries raise both the threatened LCT and endangered cui-ui. The LCT facility supports a world-class fishery; the cui-ui facility is a “fail-safe” operation to maintain the strain in case of catastrophic event (Dept. of the Interior and California DWR 2004).

4.10.2 Environmental Consequences

No Action

Under the No-Action Alternative, cultural resources, including historic and archaeological sites, Indian trust assets, and Native American concerns would remain unchanged, with various consequences. No project-related construction would occur; thus, there would be no potential adverse effects to known or undiscovered *in situ* archaeological sites. There would be no construction-related effects on fisheries or water quality. The water right transfer increasing the water flow to Pyramid Lake (as proposed under the Proposed Action) would need to be arranged by other means. Opportunities would not be realized to establish sustainable sources of native plants of value to traditional practitioners.

Proposed Action

The cultural resources inventory resulted in the identification of 19 newly identified archaeological sites, three previously recorded sites, and eight isolated finds. The sites include 15 prehistoric sites, one multi-component site, and six historic sites. A total of nine sites are recommended eligible for inclusion in the National Register of Historic Places (NRHP), of which six of these eligible sites are prehistoric and three are historic (Chambers Group 2007).

Construction and project activities have been designed and would be implemented to avoid disturbance of these archaeological sites. BLM will ensure that every historic property within the project area will have any potential adverse effects resolved, ideally through avoidance. Resolution of adverse effects will be completed prior to initiating an undertaking, pursuant to 36 CFR 800, in agreement with the Programmatic Agreement (PA)³ prepared for this project, and in consultation with PLPT, Washoe Tribe, the Colony, and the SHPO. If these cannot be accomplished, specific project undertakings will be cancelled, the planned activities will be modified to result in no adverse effect to the historic property, or, if for some reason it is not possible to avoid historic property, BLM will coordinate with the parties involved to resolve adverse effect to the property in accordance with Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulations, 36 C.F.R. Part 800.

Post-restoration vegetation harvest and management by local Native traditional practitioners will be implemented as stated in the Memorandum of Agreement (MOA) among BLM, TNC, Washoe County, PLPT, Washoe Tribe, and the Colony for Native traditional plant use. Harvest will be

³ Programmatic Agreement among the USDI Bureau of Land Management, Carson City Field Office, the USDI Bureau of Reclamation, The Nature Conservancy, and the Nevada State Historic Preservation Office Regarding the Lower Truckee River Restoration Project.

conducted once the plants have reached maturity and the land owners have been given proper notice regarding access to gather plants for local tribe use. Improvements in water quantity and quality would help maintain fishery resources.

4.10.3 Mitigation Measures

The restoration projects have been designed to avoid any ground-disturbing activities in areas containing potentially significant cultural resource sites. Construction and project activities will be conducted to avoid disturbance of known resources. Mitigation of adverse effects would be required if unknown historic properties or burials were inadvertently encountered and could be adversely affected. In the event that any evidence of historical, archaeological, paleontological, or disturbance of human remains is indicated, BLM will ensure that any potential adverse effects will be resolved, ideally through avoidance. Information on the location and nature of all cultural resources will be held confidential to the extent provided by the NHPA, Native American Graves Protection Act of 1990 (NAGPRA), and Archaeological Resources Protection Act of 1979 (ARPA).

The Programmatic Agreement (PA) among BLM, Reclamation, TNC, and the SHPO was prepared for this Proposed Action in consultation with PLPT, the Washoe Tribe, and the Colony and provides mitigation measures to avoid adverse effects from the Proposed Action. These mitigation measures are incorporated in the list below.

1. Any cultural or paleontological resources (historic or prehistoric site or object) discovered by TNC, or any person working or using the public lands on their behalf, shall be immediately reported to BLM. TNC shall suspend all operations and uses within a 100-yard vicinity of the discovery. The BLM shall insure that the discovery is treated pursuant to the National Historic Preservation Act, 16 U.S.C. § 470 et seq., and its implementing regulations, 36 C.F.R. Part 800, to document and evaluate the discovery relative to listing in the National Registry of Historic Places, to determine effect, and, as necessary, to develop appropriate mitigation measures to protect the discovery. Mitigation measures necessary to resolve any adverse effect(s) will be prescribed and/or implemented by BLM after consulting with TNC. TNC will be responsible for the cost of the documentation, evaluation, and any subsequent resolution of adverse effect. Project operations may resume only upon written authorization from BLM.
2. Prior to construction activities within the Proposed Action, BLM will be provided with a list and schedule of employees authorized to halt all activities in a discovery situation and who will be responsible for notifying BLM of any discoveries. At least one of these employees shall be present during all construction activities.
3. Should buried cultural resources such as chipped or ground stone, historic debris, building foundations, or human bone be discovered inadvertently during ground-disturbing activities, work will cease immediately in that area and within 100-yards of the finding until a BLM professional archaeologist can assess the significance of the finding. Within two days, the BLM shall evaluate the discovery pursuant to the NHPA and its implementing regulations (36 CFR Part 800) to document and evaluate the discovery relative to listing in the NRHP, to determine effect, and, as necessary, to develop appropriate mitigation measures to protect the discovery. Within five working days, BLM shall solicit concurrence on its decision for

necessary actions from the SHPO, tribes, interested persons, and, if on the Lockwood project site, Washoe County. Mitigation measures necessary to resolve any adverse effect(s) will be prescribed by BLM. Construction will resume only upon written authorization from BLM.

4. In compliance with NAGPRA, BLM will notify and consult affiliated tribal representatives for proper treatment of human remains, grave goods, items of cultural patrimony, and sacred objects should these be discovered. Human remains and associated grave goods found on state or private land will be handled according to the provisions of Nevada revised statute, Chapter 383–Historic Preservation and Archeology.
5. Any areas that BLM identifies as sensitive, through consultation with local tribes, will be monitored by an appropriate tribal expert during construction activities that may impact the area. Monitors shall have the authority to stop work if necessary to protect cultural resources, as provided in the PA.

4.11 Cumulative Effects

NEPA requires that federal agencies preparing an EA must consider the cumulative effects of a Proposed Action and other actions. According to the CEQ NEPA Regulations, cumulative effects are those effects that result from incremental impacts of a Proposed Action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions that take place over a period of time (40 CFR 1508.7). The purpose of the cumulative effects analysis is to ensure that federal decisions consider the full range of consequences.

Water resource planning projects along the Truckee River have been in existence since the early 20th century. Agency and public participation regarding restoration of the lower Truckee River have been on-going for decades. Early projects constructed water diversions and channeled supplies for irrigation and agricultural purposes; however, inefficient operations and water shortages was a significant impediment to successful farming in the region. Other projects focused on flood management, resulting in further degradation of the channel and water quality, wetlands, and riparian habitats. Current and proposed future projects are focusing on improving water quality, restoring and protecting the biological resources and habitat along the river. To assess the cumulative effects as a result of implementing the Proposed Action, a discussion of past, present, and reasonably foreseeable projects is presented below.

- The **Newlands Project** is a trans-basin diversion for agricultural development and provides water for wetlands purposes. The Newlands Project was originally intended to irrigate more than 400,000 acres of land in western Nevada using the combined waters of the Truckee and Carson Rivers; currently approximately 57,000 acres are irrigated. The Newlands Project was initiated in 1903 and has resulted in conflict and controversy over water supplies in the lower Truckee River. As mentioned in Chapter 2, water is diverted from the Truckee River into the Truckee Canal for the Truckee Division and conveyance to Lahontan Reservoir for storage, which has lead to water deficits and loss of aquatic and terrestrial habitat along the Truckee River.

- In 1975 Reclamation constructed the **Marble Bluff Dam** in response to the lowering of Pyramid Lake and Lake Winnemucca. As the Pyramid Lake level dropped, the relatively flat surface of the large Pyramid Lake delta was exposed and created a barrier to migration for obligate river-spawning fish. Lowering of the Pyramid Lake level also lowered the Truckee River's base level, creating a deep head cut, or erosional front (Otis Bay Ecological Consultants 2007a).
- The Flood Control Act of 1954 authorized the **Truckee River and Tributaries Project**, which was designed to protect the Reno metropolitan area from frequent flooding. This project channelized numerous sections of the Truckee River channel from Lake Tahoe to Pyramid Lake, and modified the river channel by making the river wider and straighter, constructing setback levels, floodwalls, and detention basins. As part of the project, the USACE removed a bedrock control immediately east of the Truckee Meadows at Vista Reef; this bedrock removal reduced the river's base flow level (100-year flood flow stage elevation) through the Truckee Meadows reach and resulted in subsequent channel bed erosion. The USACE is currently in the process of conducting a General Reevaluation Report and EIS of the feasibility of implementing a flood management and ecosystem restoration project from the west end of Reno downstream to Pyramid Lake (USACE and TNC 2005). The USACE worked with Otis Bay Ecological Consultants to identify potential restoration opportunities.
- Since 2001, TNC has implemented restoration projects along the Truckee River as part of the **Truckee River Project**. TNC is partnering with other local, state, and federal agencies, tribal groups, and interested stakeholders to enhance wildlife habitat, improve water quality, reduce flood damage, and provide recreation opportunities and open space protection. TNC purchased 305 acres along five miles of the Truckee River and most recently implemented a restoration project at McCarran Ranch. The TNC Pilot Restoration Project at McCarran was completed in 2003 and the full McCarran Ranch Restoration was completed in 2007. The restoration project at McCarran Ranch restored 3.5 miles of the Truckee River and approximately 300 acres of upland and wetland habitat.
- In 2001, the PLPT prepared a report entitled **Conservation and Management Plan for the Lower Truckee River** which consisted of four primary components: (1) geomorphological processes, (2) fishery management, (3) riparian management, and (4) water adaptive management plan. The report has since been updated and revised in 2004.
- The Truckee River Basin Recovery Implementation Team developed a **Short-Term Action Plan for Lahontan Cutthroat Trout in the Truckee River Basin** in August 2003. The plan identifies priority areas with current or potential opportunities to support the restoration and recovery of naturally reproducing lacustrine LCT. The **Cui-ui Recovery Plan**, updated in 1992, established habitat restoration objectives similar to the short-term action plan for LCT. The purpose of the plan is to identify and assign priority, including identifying the presence of fish passage barriers fragmenting the ecosystem (USACE and TNC 2005).
- The Truckee-Carson-Pyramid Lake Water Rights Settlement Act of 1990 (P.L. 101-618) Section 201(a) directs the Secretary of the Interior to negotiate an operating agreement known as the **Truckee River Operating Agreement (TROA)**. The TROA allows more efficient

operation of Truckee River reservoir: Lake Tahoe and Prosser Creek, Stampede, Boca, and Martis Creek reservoirs (Federal), and Donner and Independence Lakes (non-federal). The TROA would modify the reservoir operations to enhance coordination and flexibility while ensuring that existing water rights are served and flood control and safety of dams requirements are met. The enactment of the TROA would enhance conditions in the Truckee River for the threatened LCT and endangered cui-cui by providing sufficient flows and improving water quality conditions downstream of Sparks, Nevada.

- The **Derby Dam Fish Way** was completed in 2003 in order to facilitate migration of listed and other fish species and to reconnect the riverine ecosystem. The fish passage has not yet been operated pending construction of the Truckee Canal Fish Screen. Funding for this fish screen was earmarked in the 2008 Energy and Water Development Senate Appropriations Bill in December 2007. A construction schedule has not yet been set, but is pending in the near term.
- **Derby Dam Restoration.** To improve water quality and aquatic habitat in the Truckee River below Derby Dam, the Cities of Reno and Sparks with funding by Reclamation plan to implement a riparian and streambank restoration project.
- The **Desert Terminal Lakes Program** began with Public Law 107-171, enacted on May 13, 2002. The legislation provided \$200 million to Reclamation “to provide water to at-risk natural desert terminal lakes” but prohibited leasing or purchasing water rights. Further legislation limited the use of funding to Pyramid, Walker, and Summit lakes in the State of Nevada. The funds are available until expended and Reclamation has the authority to enter into grants and cooperative agreements. Subsequent legislation earmarked over \$170 million of the funding for more than two dozen activities. As of February 2008, nearly \$123 million has been committed to various projects. The Desert Terminal Lakes Program provides major funding for restoration, research, and management of natural resources related to the three designated desert terminal lakes.

The Proposed Action would have no adverse cumulative effects on climate, geology, socioeconomics, traffic, visual quality, noise, energy, land use, recreation, and cultural resources. The Proposed Action has the potential for participating in cumulative effects related to air quality, hydrological resources, water quality, vegetation and wildlife, and special-status species. The Proposed Action would contribute to an adverse cumulative air quality effect by adding increments of CO and particulate matter during short-term construction activities; however, the Proposed Action would not violate any air quality standards or expose sensitive receptors to significant levels of pollutants. Mitigation measures are proposed to minimize air quality emissions during construction activities, and therefore, cumulative impacts are considered less than significant.

Water quality would be adversely affected by the construction and release of water into each newly constructed meander and during construction of the riffles. Any increases in sediment levels are anticipated to return to pre-existing conditions once the construction is complete. BMPs and mitigation measures are incorporated into the proposed restoration design to minimize surface water contact with exposed cuts and fills, and reduce associated impacts. The Proposed Action would ultimately create long-term benefits associated with water quality, and therefore, cumulative impacts are considered less than significant.

Construction of the Proposed Action would generate short-term adverse effects on existing vegetation and wildlife resources in the project area. The potential effects of construction activities on wildlife habitat may displace or disturb individual resident and migratory wildlife; however, any movement of wildlife away from the project area is expected to return following construction activities.

Recreational use can lead to degradation of habitat; however, public access will be controlled by property managers, and no significant cumulative effects are foreseen. Construction of the Proposed Action also has the potential to adversely affect the Lahontan cutthroat trout and cui-ui. Mitigation measures are proposed to minimize any adverse effects on existing vegetation and wildlife and special status wildlife species, and therefore, cumulative impacts are considered less than significant.

The Proposed Action in conjunction with reasonably foreseeable future projects would restore the environmental damage from earlier projects along the river, and provide benefits related to flood management, water quality, habitat for special-status species, biological productivity and diversity, and invasive weed eradication.

Section 5 Consultation and Coordination

5.1 Agency Coordination

TNC, BLM, Reclamation, Washoe County, and the cooperating agencies have actively coordinated on the Proposed Action. Agency coordination for the Proposed Action included coordination with the USFWS in accordance with Section 7 of the Endangered Species Act (ESA). In 2006, the joint lead agencies initiated consultation with the USFWS to determine whether species listed or proposed for listing as endangered or threatened species are likely to be adversely affected by the Proposed Action. As lead federal agency for the ESA consultation, Reclamation, in cooperation with BLM, has coordinated with the USFWS on the analysis of the project and determination of effects to listed species. Reclamation initiated formal consultation in a letter to the USFWS dated February 8, 2007. The BLM has also consulted with the SHPO under Section 106 of the NHPA. The TNC coordinated with the State of Nevada Department of Wildlife through exchanges of information and data on fish and wildlife occurring in the Proposed Action area.

TNC staff have also made public presentations to County elected and appointed officials, including presentations in February 2007 to the Storey County Planning Commission and the Storey County Board of Commissioners. Both presentations occurred at regularly scheduled public meetings that were attended by Storey County residents in addition to the Commission members. The purposes of the presentations were to update the County on the status of the McCarran Ranch Restoration Project, apprise the Commission of TNC's proposed projects at the Lockwood, Mustang Ranch, and 102 Ranch sites, and inform attendees that an EA would be prepared for this Proposed Action.

5.2 Public Involvement

TNC, BLM, Reclamation, and Washoe County have implemented a comprehensive public involvement strategy as part of the EA process to ensure that interested members of the public, organizations, tribal groups, and public agencies are well informed and have meaningful opportunities to participate. CEQ NEPA Regulations require that federal agencies make diligent efforts to involve the public in preparing and implementing their NEPA procedures (40 CFR 1506.6).

The official public scoping process lasted from February 10 through March 13, 2007. Scoping, as defined by NEPA regulations (40 CFR 1501.7), is an early and open process for determining the scope of the issues to be addressed and for identifying the significant issues related to the Proposed Action. The public notices included notices in the *Reno-Gazette Journal* and in the *Sparks Tribune*. A public notice was also mailed on February 12, 2007, to approximately 150 members of the public, organizations, stakeholders, tribal groups, and public agencies, notifying them of the upcoming public workshops. Two public workshops were held, and 23 individuals attended. The purpose of the public workshops was to explain the Proposed Action and to provide an opportunity for interested parties to submit comments concerning the issues that they believed should be addressed in the EA.

Comments received during the public scoping process addressed the following issue areas:

- potential effects of recreational use on wildlife habitat;
- flooding and erosion consequences from project design, particularly at the Lockwood site;
- restored habitats harboring undesirable species (e.g., mosquitoes, rats, and other pests), which would lead to spraying for bugs and poison for rodents;
- environmental effects of herbicides, which may be used to control invasive weeds;
- inadvertent discoveries of cultural resources during project construction;
- federal and state procedures in the event of discovery of human remains; and
- access and native plant gathering by the tribes.

5.3 Tribal Consultation

TNC, BLM, Reclamation, and Washoe County have actively coordinated and consulted with tribal governments regarding the Proposed Action. Tribal consultation has been an ongoing process during the NEPA process, and will continue through subsequent construction and implementation of the proposed restoration projects. It was also a part of the McCarran Ranch restoration project. Tribal consultation is also conducted pursuant to the NHPA, AIRFA, and Indian trust assets.

Tribal consultation was initiated by letter on January 12, 2007, to the Fallon Paiute-Shoshone Tribe, PLPT, Washoe Tribe, and the Colony. This was followed by a joint tribal consultation meeting that was held on February 5, 2007, which included representatives from the PLPT, the Washoe Tribe, the Colony, BLM, Reclamation, Washoe County and TNC. On March 8, 2007, the Vice-Chair for the Fallon Paiute-Shoshone Tribe deferred to the PLPT for this project.

Three field trips have been conducted with the participating tribal governments: on March 28, April 24, and July 9, 2007. Project descriptions and maps were provided and project locations were visited. At several locations, cultural resources were examined, and participants discussed the development of an agreement for participation in the restoration and post-restoration activities, including but not limited to plant maintenance and gathering for a variety of traditional native uses. Tribal members provided information for native plants identified on the Truckee River as well as other riparian/wetland locations. On September 31, 2007, the final results of the cultural resource inventory were provided to tribal governments. Additional field trips will be conducted in 2008 and consultation will be ongoing throughout the construction and implementation of the proposed restoration projects.

Section 6 Compliance with Environmental Statutes

The relationship of the Proposed Action to applicable federal environmental requirements is summarized below. The project partners are committed to implementing the Proposed Action in compliance with applicable environmental laws, regulations, and Executive Orders.

National Environmental Policy Act (42 U.S.C. 4321 et seq.). This act requires federal agencies to identify and disclose potential environmental effects of proposed actions. This EA has been prepared in compliance with NEPA and the applicable implementing regulations. The final version of the EA will include the lead agencies' responses to public comments.

Endangered Species Act (16 U.S.C. 1531 et seq.). In accordance with Section 7 of the federal Endangered Species Act, coordination with the USFWS was initiated (concurrently with the NEPA process) to determine whether species listed or proposed for listing under the Act are likely to be adversely affected by the Proposed Action. A Biological Assessment (BA) was prepared for agency use in 2007 and submitted for formal consultation in 2008 (Reclamation and BLM 2008). In consultation with USFWS, the BA found that implementation of the restoration projects may affect and likely adversely affect the Lahontan cutthroat trout and cui-ui sucker; implementation of the identified conservation measures will avoid or substantially reduce potential adverse effects on these listed species.

Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.). The Fish and Wildlife Coordination Act requires federal agencies to coordinate with USFWS and state wildlife agencies during the planning of new projects or for modifications of existing projects so that wildlife conservation receives equal consideration with other features of such projects throughout the agencies' planning and decision making processes (44 Federal Register 29300). The joint lead agencies have coordinated with the USFWS and with the Nevada Department of Wildlife. Recommendations from the USFWS's Coordination Act Report will be incorporated into the restoration projects, as appropriate, in compliance with this Act.

Migratory Bird Treaty Act, as amended (16 U.S.C. 703 et seq.). This act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the act, taking, killing, or possessing migratory birds is unlawful. Construction of the restoration project would be scheduled to avoid adversely affecting any migratory bird species. The restoration projects would benefit migratory birds in the long-term by providing additional habitat.

Bald and Golden Eagle Protection Act. This law, originally passed in 1940, provides for the protection of the bald eagle and the golden eagle (as amended in 1962) by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16U.S.C 668(a); 50 CFR 22). "Take" includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb (16 U.S.C. 688(c); 50 CFR 22.3). A violation of the Act can result in a fine imprisonment, or both.

National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.), Historic and Archeological Resources Protection Act (16 U.S.C. 470AA et seq.), Protection of Historic Properties (36 CFR Part 800), and National Register of Historic Places (36 CFR Part 60).

Section 106 of the National Historic Preservation Act requires a federal agency to consider the effects of federal undertakings on historical and archeological resources. The implementing regulations for Section 106 are codified at 36 CFR Part 800, as amended, "Protection of Historic Properties," which requires federal agencies to afford SHPO an opportunity to advise and assist. The "National Register of Historic Places" sets the criteria and procedures for determining National Register eligibility.

American Indian Religious Freedom Act of 1978 (Public Law 95-341, 92 Stat. 469; 42 U.S.C. 1996). This act directs federal agencies to evaluate their policies and procedures to ensure the right of freedom for American Indian, Eskimo, Aleut, and Native Hawaiians to believe, express, and exercise their traditional religions, including the rights of access to religious sites, use and possession of sacred objects, and freedom to worship through traditional ceremonies; the Act is also intended to ensure that rites are not disrupted by agency practices.

Archaeological Resources Protection Act of 1979 (Public Law 96-95; 93 Stat. 721; 16 U.S.C. 470aa) and Protection of Archaeological Resources (43 CFR Part 7). This act protects and manages materials of archaeological interest from unauthorized removal or destruction and requires federal agencies to develop plans and schedules to locate archaeological resources. "Protection of Archaeological Resources" defines the process for "Notification to Indian tribes of possible harm to, or destruction of, sites on public lands having religious or cultural importance.

Native American Graves Protection and Repatriation Act of 1990 (Public Law 101-601; 104 Stat. 2048; 25 U.S.C. 3001) and Native American Graves Protection and Repatriation Regulations (43 CFR Part 10). This act requires federal agencies and museums to inventory, determine ownership of, and repatriate cultural items (such as human remains, funerary objects, sacred objects, and objects of cultural patrimony) under their control or possession. Native American Graves Protection and Repatriation Regulations cover procedures for complying with the Act.

Religious Freedom Restoration Act of 1993 (42 U.S.C. §2000bb). This act is aimed at preventing laws which substantially burden a person's free exercise of their religion even if the burden results from a rule of general applicability, unless the burden is essential to further a "compelling governmental interest" and is the least restrictive means of furthering that interest.

Bureau of Land Management Manual Series 8120, Tribal Consultation Under Cultural Resource Authorities and H-8120-1, Guidelines for Conducting Tribal Consultation (43 CFR 1600). The purpose of Manual Series is to clarify legal relationships between BLM and American Indians and Alaska Natives and to provide basic policy direction on BLM's consultation responsibilities under cultural resource-related laws and executive order, regarding cultural, historical, and religious concerns of American Indians and Alaska Natives.

Clean Air Act (42 U.S.C. 1857 et seq.), as amended and recodified (42 U.S.C. 7401 et seq.). The Proposed Action is not expected to violate any standards, increase violations, exceed EPA's conformity *de minimis* thresholds, or hinder the attainment of air quality objectives in the local air basin. It has been determined that the restoration work would have no significant adverse effects on

the future air quality of the area and is in compliance with this act. Since the project would not exceed *de minimis* thresholds, a conformity determination would not be required.

Clean Water Act (33 U.S.C. 1251 et seq.). A reconnaissance-level investigation conducted by North State Resources, Inc. identified potential waters of the United States at each of the proposed restoration sites. A formal delineation of waters of the U.S. may be required to determine the extent of USACE jurisdiction under the Rivers and Harbors Act and Clean Water Act if any proposed actions would result in the discharge of dredged or fill material into waters of the U.S.

Executive Order 11990, Protection of Wetlands. The order directs federal agencies to avoid adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands, whenever there is a practical alternative. The Proposed Action would result in restoring wetlands and would be in compliance with this order.

Executive Order 11988, Floodplain Management. The order directs all federal agencies to avoid, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development whenever there is a practicable alternative. The Proposed Action would support the natural functions of floodplains and would not involve or encourage floodplain development; thus, the Proposed Action would be in compliance with this order.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The order directs all federal agencies to identify and address adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Due to the rural location and the beneficial nature of this project, there would be no adverse effects to human health or the local economy.

Executive Order 13007, Indian Sacred Sites. The order directs federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites.

Executive Order 13112, Invasive Species. The order directs federal agencies to prevent the introduction of invasive species and to not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species. The Proposed Action includes measures to eradicate weeds and avoid the introduction and spread of invasive species.

Executive Order 13175, Consultation and Coordination With Indian Tribal Governments. The order directs federal agencies to establish regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications; strengthen government-to-government relations with Indian tribes; and reduce the imposition of unfunded mandates upon Indian tribes.

Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation. The order (signed in 2007) directs federal agencies that have programs and activities with a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. This order emphasizes conservation and management of migratory birds species that are not necessarily protected under the Endangered Species Act, but are protected under the Migratory Bird Treaty Act of 1918. The order directs federal agencies, whose direct activities will likely result in the take of migratory birds, to develop and implement a Memorandum of Understanding with the U.S. Fish and Wildlife Service that shall promote the conservation of bird populations.

Presidential Memorandum of April 29, 1994, “Government-to-Government Relations with Native American Tribal Government.” This memorandum directs the heads of departments and agencies to implement activities affecting Indian tribal rights or trust resources by consulting with tribes in a knowledgeable, sensitive manner respectful of tribal sovereignty.

Section 7 Environmental Commitments

The Proposed Action incorporates many measures that, when followed during project implementation, can be expected to reduce or avoid adverse environmental effects. In addition, this EA has also identified a number of additional mitigation measures. NEPA encourages agencies to identify measures to reduce or avoid adverse environmental consequences; further, the Reclamation NEPA Handbook recommends that an EA include a list of environmental commitments, including management actions. The responsibility for ensuring the implementation of these measures lies generally with the two lead agencies, Reclamation and BLM, which will ensure, among other implementation activities, that they and TNC include these mitigation measures in contract documents and other agreements, as applicable. For purposes of the Endangered Species Act and the Biological Opinion issued by the USFWS, Reclamation will be the federal agency held responsible for ensuring implementation of all reasonable and prudent measures.

7.1 General

All applicable permits and approvals will be obtained prior to implementation of the project, and responsible parties will comply with all terms and conditions of those permits and approvals to minimize adverse effects on the environment. Several construction-related permits and authorizations from federal, state, and local agencies are anticipated that will likely require similar and/or additional protective measures for implementation of the Proposed Action. Permits that will likely be required include:

1. Clean Water Act (CWA) Section 404, administered by the USACE, which regulates discharge of dredged or fill materials into waters of the United States;
2. CWA Section 401, administered by the State of Nevada, which regulates state water quality standards related to discharges of fill or dredged materials into waters of the United States;
3. NPDES stormwater pollution prevention permit program, administered by the State of Nevada, which regulates all point and non-point source pollutant discharges; and Washoe County special use and/or grading ordinance compliance permits; and
4. Reciprocal flood conveyance authorizations in the form of (a) a Flowage Easement granted by BLM to the State of Nevada to allow for the Truckee River to flow through and flood the public lands within the Mustang and 102 Ranch project area and (b) an easement from the State of Nevada to BLM to use and occupy the land currently within the bed and banks of the Truckee River, whether existing or historic for restoration purposes.
5. Temporary Working in Waterways Permit from the State of Nevada Division of Environmental Protection.
6. Special Use Permit from Storey County.
7. Grading Permit from Washoe County.

8. Dust and Vector Control Permits from Washoe County.
9. Letters of Permission from the Nevada State Engineer, Nevada Department of Wildlife.

7.2 Air Quality

Construction plans and specifications will include BMPs to ensure that construction activities incorporate feasible measures to minimize the generation of air pollutants, including particulate matter and CO. Measures to be incorporated include, but are not necessarily limited to, requirements to:

- AQ-1. Properly maintain all equipment and engines.
- AQ-2. As a general rule, keep all equipment and engines idling below 10 minutes.
- AQ-3. Encourage workers to carpool to the construction area.
- AQ-4. Schedule the movement of construction materials during off-peak hours for travel.
- AQ-5. Use water trucks to reduce airborne dust from leaving the project site. Require increased water frequency whenever wind speeds exceed 15 miles per hour. Emphasis would be placed on watering unpaved roadways during periods of high vehicle movement.
- AQ-6. Limit the speed for all construction equipment to 10 miles per hour on any unpaved surface.
- AQ-7. Do not excavate or grade soils during periods in which wind speeds are greater than 20 miles per hour averaged over one hour.
- AQ-8. Maintain at least 2 feet of freeboard on trucks hauling loads of excavated materials, and cover loads of all haul/dump trucks securely on days with high winds or when traveling at speeds to cause dust to be released from the vehicles.
- AQ-9. Operate all equipment so as to enter and leave the construction site by a designated route to reduce airborne dust.
- AQ-10. Use BMPs with excavated soil stockpiles to reduce wind erosion; measures include, but are not limited to, covering with tarps or spraying with water to control dust.

7.3 Hydrology and Water Quality

Construction plans and specifications will include BMPs to ensure that construction activities incorporate feasible measures to minimize water quality effects. Measures to be incorporated include, but are not necessarily limited to, requirements to:

- WQ-1. TNC and its contractors will prepare and implement a water quality and sediment control plan for the Proposed Action. The plan will identify BMPs for the projects, including silt fences, sediment filters, watering, and routine monitoring to verify effectiveness. Proper implementation of erosion and sediment controls shall be adequate to minimize sediment inputs into the Truckee River until construction ends. All sediment containment devices and

erosion control devices will be inspected daily during the construction period to ensure that the devices are functioning properly. Silt curtains will be installed in order to minimize the amount of turbid water escaping the construction site and to prevent settleable solids from drifting outside of the immediate project work site. Silt curtains shall be kept in good working order; they shall be designed to allow fish that may enter the curtained area adequate passage to exit freely.

- WQ-2. Any new or previously excavated rock or gravel material placed in the Truckee River channel shall be washed of foreign materials prior to installation. Water containing mud or silt from aggregate washing or other operations shall be treated by filtration or retention in a settling pond or ponds adequate to prevent muddy water from entering the river.
- WQ-3. The contractor shall not perform any clearing and grubbing or earthwork on the project until the State Water Pollution Prevention Plan (SWPPP) has been accepted.
- WQ-4. All work within the river channel will occur when the river has low flows.

In the final design for the Lockwood site, TNC and its design contractor shall ensure that the proposed new channel does not exacerbate erosion problems near roadways and structures.

Construction plans and specifications shall include measures to reduce potential impacts on water quality associated with accidental spills of pollutants (fuel, oil, grease, etc.) in the Proposed Action area, including the following:

- WQ-5. Equipment and materials shall be stored away from wetland and surface water features.
- WQ-6. Vehicles and equipment used during construction shall receive proper and timely maintenance to reduce the potential for mechanical breakdowns leading to a spill of materials. Maintenance and fueling shall be conducted in an area at least 150 feet away from waters of the Truckee River or within an adequate fueling containment area.
- WQ-7. The contractor will develop and implement site-specific Best Management Practices (BMPs), a water pollution control plan, and emergency spill control plan. The contractor will be responsible for immediate containment and removal of any toxins released.
- WQ-8. In regard to dewatering activities, all material and water required for excavation and installation will be contained and disposed of in accordance with the required regulatory permits.

To reduce potential impacts associated with accidental spills or leakage of petroleum products from work related to the realignment of the Kinder Morgan Pipeline, the following measures shall be implemented:

- WQ-9. The contractor working on the pipeline will develop and implement site-specific Best Management Practices (BMPs), a water pollution control plan, and an emergency spill control plan.

WQ-10. The contractor will be responsible for immediate containment and removal of any petroleum products or other harmful pollutants released into the environment. Necessary equipment and materials to contain and clean up any inadvertent spills shall be maintained in the immediate work vicinity.

To minimize potentially adverse effects due to herbicide applications at the restoration sites, the following mitigation measures will be implemented:

WQ-11. All mixing and transfers of herbicides from one container to another be done over plastic tarp in an upland location greater than 100 yards from riparian, wetland, or river areas.

WQ-12. A spill kit containing shovels and absorbents shall be readily available onsite during construction to contain and soak up any leakage or spills.

WQ-13. In the event of a spill, soil contaminated with product will be immediately excavated and placed in leak-proof containers.

WQ-14. Personnel applying herbicides will be instructed on their environmental hazards, the importance of keeping the product out of and away from the river and wetlands, and will be provided with notification and containment procedures if an accidental spill occurs.

WQ-15. Empty containers shall be disposed of according to label directions and plastic bags shall be used to dispose of any waste materials in contact with herbicides;

WQ-16. To avoid consequences of overspray onto native plant species or onto water surfaces, spray activities shall be conducted on non-windy days and any herbicide application shall be ceased if windy conditions arise.

WQ-17. Herbicide application shall not be conducted if precipitation is forecast within 72 hours and application shall be suspended for at least 24 hours subsequent to a precipitation event.

7.4 Non-native Vegetation

NV-1. Prior to removing non-native vegetation adjacent to the river, barriers will be installed to prevent weeds from entering the river and moving downstream

NV-2. Prior to construction, tall whitetop and hairy whitetop (whitetop species) will be mowed at the early bolting stage (mid-May), allowing it to regenerate back to the early bloom stage (late June) and then spraying it with a weed herbicide and surfactant. Spraying should occur when conditions are calm and no precipitation is forecasted for several days.

NV-3. For areas adjacent to the river and wetlands, whitetop species will be hand-pulled. Re-growth will be treated with weed herbicide using a wick applicator. Tall whitetop should be spot-treated at the late bud to early flower stage.

NV-4. Whitetop species and other invasive perennials should be treated with herbicide prior to any revegetation efforts.

- NV-5. Where possible, weed-infested soil should be scraped away and clean topsoil should be spread over planting sites. Sites should be ripped deeply and thoroughly after scraping and before spreading.
- NV-6. Prior to replanting, remove or limit undesirable vegetation and litter.
- NV-7. The site will be monitored for new infestations of invasive weeds. Any new infestations will be controlled and, to the extent possible, eradicated in a timely manner to prevent further propagation.
- NV-8. Non-native vegetation shall be controlled after the restoration projects have been completed and the native plants are established.

7.5 Fish and Wildlife

Construction plans and specifications will include measures to ensure that construction activities incorporate feasible measures to avoid or minimize adverse effects to wildlife, including nesting migratory birds. Measures to be implemented include, but are not necessarily limited to, requirements to:

- FW-1. Land clearing and mowing would be conducted outside of the avian breeding season if feasible. If this is not possible, a qualified biologist shall conduct a minimum of one survey for nesting special-status birds within a 250-foot buffer around proposed construction activities. The survey may be conducted no more than one week prior to the onset of any construction activity. Active nests located within 250 feet of construction activities shall be mapped; and a qualified biologist in consultation with the Nevada Department of Wildlife and/or BLM as appropriate will determine the extent of a construction free buffer zone to be established. A qualified biologist shall monitor the nest(s) to determine when the young have fledged and submit status reports to the Nevada Department of Wildlife and/or BLM, as appropriate, throughout the nesting season. An active nest may only be removed after the young have fledged (based on field verification).
- FW-2. If vegetation is to be removed and all necessary approvals have been obtained, potential nesting substrate (e.g., trees and shrubs) that will be removed in the Action Area may be removed between November 1 and February 28 (i.e., outside the nesting season) to minimize the potential for active nests to be disturbed as a result of construction activities.
- FW-3. A minimum of one survey shall be conducted for nesting short-eared owl, western burrowing owl, sage grouse, loggerhead shrike, Lewis's woodpecker, and vesper sparrow within a 250-foot buffer around proposed construction activities by a qualified biologist. The survey may be conducted no more than one week prior to the onset of any construction activity. Active nests located within 250 feet of construction activities shall be mapped; and
- FW-4. A qualified biologist in consultation with the Nevada Department of Wildlife will determine the extent of a construction free buffer zone to be established if an active nest (a nest containing eggs or young) is found. A qualified biologist shall monitor the nest(s) to determine when the young have fledged and submit status reports to the Nevada Department

of Wildlife, as appropriate, throughout the nesting season. An active nest may only be removed after the young have fledged (based on field verification).

The following mitigation measures will be implemented to minimize injury and mortality of juvenile and adult fish for LCT during all in channel work including, but not limited to, construction of riffle habitat, excavation of sediment plug, construction of the cut-over dike, and installation and excavation of the silt curtains.

- FW-5. In-water work may occur from July through September as water temperatures and dissolved oxygen levels during this period are typically unsuitable for LCT.
- FW-6. No in-water construction and stream diversion actions during the spring migration (April to July).
- FW-7. Equipment shall be operated slowly and deliberately to minimize potential injury and mortality of juvenile and adult fish during excavation and placement of fill materials within the active channel. The contractor shall be instructed that before submerging an excavator bucket, or placing fill gravel below the water surface, the excavator bucket or equipment will be operated to “tap” the surface of the water.
- FW-8. Dewatering of the existing channel will be conducted slowly and deliberately to allow fish salvage operations and prevent the mortality of juvenile or adult LCT. A qualified fishery biologist shall be present to safely capture and relocate any LCT remaining in the existing channel. The fish will be immediately relocated to a suitable location outside of the project area using accepted fishery techniques to reduce stress and safely relocate juvenile or adult LCT and any other additional fish species.
- FW-9. Conduct appropriate special status species surveys prior to the commencement of construction in order to avoid adverse effects to listed species and species of concern.
- FW-10. Potential impacts to wildlife from herbicide use, spills of hazardous materials, and sedimentation shall be minimized by implementing the mitigation outlined in Section 4.4 Water Quality.

7.6 Cultural Resources

- CR-1. Implementation of the Proposed Action shall be conducted in accord with the Programmatic Agreement (PA) among BLM, Reclamation, TNC, and the SHPO. Information on the location and nature of all cultural resources will be held confidential to the extent provided by the National Historic Preservation Act (NHPA), Native American Graves Protection Act of 1990 (NAGPRA), and Archaeological Resources Protection Act of 1979 (ARPA).
- CR-2. In the event that any evidence of historical, archaeological, paleontological, or disturbance of human remains exists, BLM will insure that any potential adverse effects will be resolved, ideally through avoidance.
- CR-3. Any cultural or paleontological resources (historic or prehistoric site or object) discovered by TNC, or any person working or using the public lands on their behalf, shall be

immediately reported to BLM. TNC shall suspend all operations and uses within a 100-yard vicinity of the discovery. The BLM shall insure that the discovery is treated pursuant to the National Historic Preservation Act, 16 U.S.C. § 470 et seq., and its implementing regulations, 36 C.F.R. Part 800, to document and evaluate the discovery relative to listing in the National Registry of Historic Places, to determine effect, and, as necessary, to develop appropriate mitigation measures to protect the discovery. Mitigation measures necessary to resolve any adverse effect(s) will be prescribed and/or implemented by BLM after consulting with TNC. TNC will be responsible for the cost of the documentation, evaluation, and any subsequent resolution of adverse effect. Project operations may resume only upon written authorization from BLM.

- CR-4. Prior to construction activities within the restoration areas, BLM will be provided with a list and schedule of employees authorized to halt all activities in a discovery situation and who will be responsible for notifying BLM of any discoveries. At least one of these employees shall be present during all construction activities.
- CR-5. Should buried cultural resources such as chipped or ground stone, historic debris, building foundations, or human bone be discovered inadvertently during ground-disturbing activities, work will cease immediately in that area and within 100-yards of the finding until a BLM professional archaeologist can assess the significance of the finding. Within two days, the BLM shall evaluate the discovery pursuant to the NHPA and its implementing regulations (36 CFR Part 800) to document and evaluate the discovery relative to listing in the NRHP, to determine effect, and, as necessary, to develop appropriate mitigation measures to protect the discovery. Within five working days, BLM shall solicit concurrence on its decision for necessary actions from the SHPO, tribes, interested persons, and, if on the Lockwood project site, Washoe County. Mitigation measures necessary to resolve any adverse effect(s) will be prescribed by BLM. Construction will resume only upon written authorization from BLM.
- CR-6. In compliance with NAGPRA, BLM will notify and consult affiliated tribal representatives for proper treatment of human remains, grave goods, items of cultural patrimony, and sacred objects should these be discovered. Human remains and associated grave goods found on state or private land will be handled according to the provisions of Nevada revised statute, Chapter 383–Historic Preservation and Archeology.
- CR-7. Any areas that BLM identifies as sensitive, through consultation with local tribes, will be monitored by an appropriate tribal expert during construction activities that may impact the area. Monitors shall have the authority to stop work if necessary to protect cultural resources, as provided in the PA.
- CR-8. Prior to construction activities within the restoration areas, BLM will be provided with a list and schedule of employees authorized to halt all activities in a discovery situation and who will be responsible for notifying BLM of any discoveries. At least one of these employees shall be present during all construction activities.
- CR-9. Based on the MOA, land owners and managers agree to allow local tribal members access to gather reasonable amounts of plants for Native traditional uses without charging a fee or

requiring a permit. Local tribes agree to provide land managers at least two working days notice prior to gathering plants for Native American traditional uses.

- CR-10. In order to minimize the potential adverse effects on vegetation at the restored sites, post-restoration vegetation harvest will take place on native plants of value by the local tribes after the native plants are self-sustainable (estimated to be a minimum of 3 years). BLM agrees to collaborate with local tribes in a plant stewardship program for tribal members to cultivate and tend traditional-use plants before and after they reach maturity using traditional plant management practices.

Section 8 List of Preparers

The following lists the agencies, organizations, and individuals responsible for the preparation of this EA. BLM and Reclamation, as joint lead agencies, had primary oversight responsibility for the document under NEPA. North State Resources, Inc. was retained by TNC to assist with NEPA and related environmental compliance services.

Substantive contributions to this EA were derived from technical reports prepared by Otis Bay Ecological Consultants (ecological conditions and project design reports) and the Chambers Group, Inc. (cultural resources). Document review was provided by TNC and partner agencies.

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Section 9 References and Bibliography

- Alabaster, J.S., and R. Lloyd. 1980. *Water Quality Criteria for Freshwater Fish*. Boston, Massachusetts: Buttersworth, Inc.
- Bell et al. 1999. Surface Faulting and Paleoseismic History of the 1932 Cedar Mountain Earthquake Area, West-Central Nevada, and Implications for Modern Tectonics of the Walker Lane. *Geological Society of America Bulletin*. June 1999.
- Berg, L., and T.G. Northcote. 1985. Changes in Territorial, Gill-flaring, and Feeding Behavior in Juvenile Coho Salmon (*Oncorhynchus kisutch*) Following Short-term Pulses of Suspended Sediment. *Can. J. Fish. Aquat. Sci.* 42:1410-1417.
- Bjornn, T.C., and D.W. Reiser. 1991. Habitat Requirements of Salmonids in Streams. *In Influences of Forest Rangeland Management on Salmonid Fishes and their Habitats*. Edited by W. R. Meehan. Bethesda, Maryland: American Fisheries Society Special Publication 19.
- BLM. 2007. IM-2008-050 Migratory Bird Treaty Act – Interim Guidance. December 18, 2007. Unpubl. Doc. Carson City Field Office files.
- Bonham, H.F. 1969. *Geology and Mineral Deposits of Washoe and Storey Counties, Nevada*. Nevada Bureau of Mines and Geology, Bulletin 70. Mackay School of Mines, University of Nevada, Reno.
- Bozek, M.A., and A.W. Hubert. 1992. Segregation of Resident Trout in Streams as Predicted by Three Habitat Dimensions. *Canadian Journal of Zoology* 70 (Bozek, M. A., and A. W. Hubert. 1992).
- CH2M Hill. 2007. *Truckee River Flood Control Project: Habitat Evaluation Procedure and Aquatic Habitat Evaluation for the Truckee Meadows and Lower Truckee River Restoration Reaches*. Boise: Prepared by CH2M Hill for the U.S. Army Corps of Engineers, Sacramento District.
- Chambers Group, Inc. 2007. *A Class III Cultural Resources Inventory of the Truckee River Restoration Project, Washoe and Storey Counties, Nevada*. Prepared for the U.S. Bureau of Land Management. Final Report. October 2007. BLM Report No. CRR 3-2365. [limited distribution]
- Chisholm, Graham, and Larry A. Neel. 2002. *Birds of the Lahontan Valley*. Reno and Las Vegas: University of Nevada Press.
- Coleman, M.E. 1986. *Evaluation of Spawning Runs at the Marble Bluff Fish Facility, Nixon, Nevada, 1978 to 1985*. Portland, OR: U.S. Fish and Wildlife Service. Fisheries Resources report FR1/FAO-86-1 1.
- Coleman, M. E., and V.K. Johnson. 1988. Summary of Trout Management at Pyramid Lake, Nevada, with Emphasis on Lahontan Cutthroat Trout, 1954–1987. *In Status and Management of Interior Stocks of Cutthroat Trout*, edited by R. E. Gresswel. Bethesda, Maryland: American Fisheries Society, Symposium 4.

- d'Azevedo, Warren. 1986. Introduction. *In Handbook of North American Indians*, Vol. 11: Great Basin, edited by W.L. d'Azevedo. Smithsonian Institution, Washington, D.C.
- dePolo, Craig, John G. Anderson, Diane M. dePolo, and Jonathan G. Price. 1997. Earthquake Occurrence in the Reno-Carson City Urban Corridor. Nevada Bureau of Mines and Geology, University of Nevada, Reno Seismological Laboratory, Department of Geological Sciences. Seismological Research Letters, Volume 68, May/June, 1997.
- Divisions of Hydrologic and Earth and Ecosystem Science, Desert Research Institute, University and Community College System of Nevada. 2005. Baseline Hydrologic and Biological Monitoring, McCarran Ranch Restoration Project Lower Truckee River, Nevada (2003-2004).
- Dobkin, D. S. 1998. Conservation and Management of Neotropical Migrant Land Birds in the Great Basin. University of Idaho Press, Moscow.
- Environmental Protection Agency. 1997. Mercury Study Report to Congress. Volume III Fate and Transport of Mercury in the Environment. December 1997. Office of Air Quality Planning and Standards. Washington, D.C.
- Fowler, Catherine S. and Sven Liljebad. 1986. Northern Paiute. *In Great Basin*, edited by Warren L. d'Azevedo. *Handbook of North American Indians*, Vol. 11: Great Basin. W. C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.
- Gustin, Mae Sexauer, Laurel Saito, and Mary Peacock. 2005. Anthropogenic Impacts on Mercury Concentrations and Nitrogen and Carbon Isotope Ratios in Fish Muscle Tissue of the Truckee River Watershed. Department of Natural Resources and Environmental Sciences MS370, University of Nevada-Reno. *Science of the Total Environment*. Vol. 347.
- Harvey, B.C., and J.A Stewart. 1991. Fish Size and Habitat Depth Relationships in Headwater Streams. *Oecologia* 87:336-342.
- Higgins, Damian K., Peter L. Tuttle, and J. Scott Foote. 2006. Preliminary Assessment of Contaminants and Potential Effects to Fish of the Truckee River, Nevada. pp. 29.
- Lawrence, S.J. 1998. Trace-Element Enrichment in Streambed Sediment and Crayfish, Carson and Truckee Rivers, Nevada and California, September 1992: U.S. Geological Survey Water Resources Investigations Report 97-4258.
- Lichvar, Robert and Michael Ericsson. 2005. Delineation of Aquatic Resources Using Vegetation Communities and Fluvial Surfaces within Selected Reaches of the Truckee River, Washoe, and Storey Counties, Nevada. Hanover, New Hampshire: U.S. Army Corps of Engineers.
- Lyons, W.B., D.M. Wayne, J.J. Warwick, and G.A. Doyle. 2004. The Hg Microchemistry of a Geothermal Stream, Steamboat Creek, Nevada: Natural vs. Anthropogenic Influences. *Environmental Geology* 34 (2&3):143-150.
- Mac, M. J., P. A. Opler, C. E. Puckett Haecker, and P. D. Doran. 1988. Great Basin--Mojave Desert Region. Status and Trends of the Nation's Biological Resources. U.S. Department of the Interior, U.S. Geological Survey, Reston, Virginia.

- Montgomery Watson Harza 2002. Flood Damage Reduction Alternatives Design Paper, Truckee Meadows Flood Damage Reduction and Ecosystem Restoration Project. Prepared for U.S. Army Corps of Engineers Sacramento District. Contract No. DACW05-01-0-0008. September 2002.
- North State Resources, Inc. (NSR). 2008. Truckee River Restoration Projects Biological Assessment. Prepared for BLM, Reclamation, and The Nature Conservancy. February 2008.
- Otis Bay Ecological Consultants 2004. Lower Truckee River Final Geomorphic Assessment and Final Preliminary Design (Vista to Pyramid Lake). Prepared for the Army Corps of Engineers, Sacramento District. January 2004.
- Otis Bay Ecological Consultants. 2007a. Preliminary Ecological Restoration Plan for the Upper Lockwood, 102 Ranch, and Mustang Reaches of the Truckee River. Prepared for The Nature Conservancy. August 28, 2007.
- Otis Bay Ecological Consultants. 2007b. Tech Memo #4 – Lockwood River Restoration HEC-RAS Modeling, Existing and Proposed Condition Lockwood Restoration Site HEC-RAS 4.0 Flow Model. September 14, 2007. Prepared for The Nature Conservancy. Reno, Nevada.
- Otis Bay Ecological Consultants. 2007b. Tech Memo #4 – Mustang Ranch River Restoration HEC-RAS Modeling, Existing and Proposed Condition Mustang Ranch Restoration Site HEC-RAS 4.0 Flow Model. September 14, 2007. Prepared for The Nature Conservancy. Reno, Nevada.
- Otis Bay Ecological Consultants. [nd.] A Comprehensive Assessment of the Benefits of Restoring the Lower Truckee River (between Sparks and Wadsworth): A Report for The Nature Conservancy.
- Robinson Engineering Company, Inc. 2006. Phase I Environmental Site Assessment Monday Property, Lockwood Road, Sparks, NV. Prepared for The Nevada Land Conservancy, Reno, NV. April 26, 2006.
- Rood, S.B., C.R. Gourley, E.M. Ammon, L.G. Heki, J.R. Klotz, M.L. Morrison, D. Mosley, G.G. Scoppettone, S. Swanson, and P.L. Wagner. 2003. Flows for Floodplain Forests: A Successful Riparian Restoration. *BioScience* 53 (7):647-656.
- Scoppettone, G. G., G. A. Wedemeyer, M. Coleman, and H. Burge. 1983. Reproduction by the Endangered Cui-ui in the Lower Truckee River. *Transactions of the American Fisheries Society* 112:788-793.
- Scoppettone, G.G., M.E. Coleman, and G.A. Wedemeyer. 1986. Life History and Status of the Endangered Cui-ui of Pyramid Lake, Nevada: U.S. Fish and Wildlife Service, Fish and Wildlife Research 1.
- Sigler, W.F., and J.W. Sigler. 1987. *Fishes of the Great Basin: A Natural History*. University of Nevada Press, Reno, Nevada.
- Snyder, J.O. 1917. The Fishes of the Lahontan System of Nevada and Northeastern California: United States Bureau of Fisheries Bulletin (1915-1916) 35: 31-86.
- State of Nevada Department of Conservation and Natural Resources (Nevada DCNR), Division of Water Resources. 1997. *A Chronological History of Lake Tahoe and the Truckee River and*

9. References and Bibliography

- Related Water Issues. (“Truckee River Chronology”). A Nevada River Chronology Publication Series. Available on the Internet at: <http://water.nv.gov/water%20planning/truckee/trchrono.htm>
- State of Nevada Department of Conservation and Natural Resources (Nevada DCNR). 2007a. Natural Heritage Program. Recorded Endangered, Threatened, Candidate, and At Risk Plant and Animal Elements obtained for the Lower Truckee River Restoration Project. GIS ArcView data set.
- State of Nevada Department of Conservation and Natural Resources (Nevada DCNR). 2007b. Natural Heritage Program. Available on the Internet at: <http://heritage.nv.gov/index.htm> [including the] Ecology Sub-site at: <http://heritage.nv.gov/ecology/ecology.htm>.
- State of Nevada Department of Conservation and Natural Resources (Nevada DCNR). 2007c. Natural Heritage Program. Storey County Rare Plant Species List. March 18, 2004. Available on the Internet at: <http://heritage.nv.gov/lists/costorey.htm>
- State of Nevada Department of Conservation and Natural Resources (Nevada DCNR). 2007d. Natural Heritage Program. Washoe County Rare Plant Species List. March 18, 2004. Available on the Internet at: <http://heritage.nv.gov/lists/cowashoe.htm>
- State of Nevada Department of Conservation and Natural Resources (Nevada DCNR). 2007e. Natural Heritage Program. National Vegetation Classification for Nevada. September 26, 2003 [viewed June 2007. Available on the Internet at: http://heritage.nv.gov/ecology/nv_nvc.htm.
- State of Nevada Department of Conservation and Natural Resources (Nevada DCNR). 2007f. Natural Heritage Program. Detailed Rare Animal List, March 18, 2004 [viewed June 2007. Available on the Internet at: <http://heritage.nv.gov/datasens.htm>.
- State of Nevada Department of Transportation. 2006. Annual Traffic Report 2006. Available on the Internet at: http://www.nevadadot.com/reports_pubs/Traffic_Report/.
- State of Nevada Department of Wildlife. 2006. Nevada Wildlife Action Plan. Reno: Nevada Department of Wildlife.
- State of Nevada Division of Environmental Protection. 2005. EPA Approved Final Nevada’s 2004 303(d) Impaired Waters List. November 2005. Bureau of Water Quality Planning. Carson City, Nevada.
- Tabor, R.W., S.E. Ellen, and M.M. Clark. 1983. Geology, Geophysics, Geologic Hazards and Engineering and Geologic Character of Earth Materials in the Washoe Lake Area: Text to Accompany Maps of the Environmental Series, Washoe City Quadrangle, Nevada. Nevada Bureau of Mines and Geology Report, Open File 83-7.
- The Nature Conservancy. 2005. Lower Truckee River Restoration: Re-vegetation and Weed Control Applied Methods and Best Management Practices Manual. November 2005 revision.
- Truckee Meadows Regional Planning Agency (TMRPA). 2006. 2002 Truckee Meadows Regional Plan. Amended July 27, 2006.
- U.S. Army Corps of Engineers (USACE). 1995. Lower Truckee River, Nevada Reconnaissance Report. July 1995.

- U.S. Army Corps of Engineers (USACE). 1997. Truckee Meadows, Nevada Reconnaissance Re-Evaluation Report. Sacramento District. August 1997.
- U.S. Army Corps of Engineers (USACE). 1998. Lower Truckee River Pyramid Lake Paiute Tribe Feasibility Study. Project Alternatives Report, Sacramento District. Contract No. DAWC 05-97-D-0018.
- U.S. Army Corps of Engineers (USACE). 2002. Flood Damage Reduction Alternatives Design Paper, Truckee Meadows Flood Damage Reduction and Ecosystem Restoration Project. Sacramento District. Contract No. DACW05-01-0-0018. September 2002.
- U.S. Army Corps of Engineers and The Nature Conservancy (USACE and TNC). 2005. McCarran Ranch –Truckee River Section 1135 Project Modification for Improvement of the Environment Washoe and Storey Counties, Nevada. Final Detailed Project Report and Final Environmental Assessment. June 2005. [Including EA as supplemented and adopted by Reclamation with related FONSI (June 16, 2006)].
- U.S. Bureau of Land Management (BLM). 2001. Carson City Field Office Consolidated Resource Management Plan. May 11, 2001.
- U.S. Bureau of Reclamation. 2007. Newlands Project. Available on the Internet at: <http://www.usbr.gov/dataweb/html/newlands.html>. Accessed July 2007.
- U.S. Census Bureau. 2006. 2006 Population Estimates. Available on the Internet at: <http://www.census.gov/>. Accessed January 2008.
- U.S. Census Bureau. 2000. 2000 Population Estimates. Available on the Internet at: <http://www.census.gov/>. Accessed January 2008.
- U.S. General Accounting Office. 1993. Livestock Grazing on Western Riparian Areas. Page 44. U.S. General Accounting Office, Gaithersburg, MD.
- U.S. Geologic Survey. 1998. River and Reservoir Operations Model, Truckee River Basin, California and Nevada. Water Resources Investigations Report 01-4017.
- U.S. Department of the Interior Bureau of Reclamation, Fish and Wildlife Service, and Bureau of Indian Affairs, and State of California Department of Water Resources (U.S. Dept. of the Interior and California DWR) 2004. Final Environmental Impact Statement/Environmental Impact Report [for the] Truckee River Operating Agreement, California and Nevada. January 2008.
- U.S. Environmental Protection Agency (EPA). 1994. TMDL Case Study: Truckee River, Nevada. U.S. Environmental Protection Agency, Office of Water. August 1994.
- U.S. Environmental Protection Agency (EPA). 1989. The Potential Effects of Global Climate Change on the United States. December 1989. Available on the Internet at: <http://www.epa.gov/climatechange/>.
- U.S. Environmental Protection Agency (EPA). 2007. National Ambient Air Quality Standards. Available on the Internet at: <http://www.epa.gov/ttn/naaqs/>.

- U.S. Fish and Wildlife Service. 1992. Cui-ui (*Chasmistes cujus*) recovery plan: Second revision. Portland: Prepared by the Cui-ui Recovery Team for the U.S. Fish and Wildlife Service.
- U.S. Fish and Wildlife Service. 1995. Recovery Plan for the Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*). Portland, OR.
- U.S. Fish and Wildlife Service. 2003. Short-term action plan for Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) in the Truckee River Basin. Reno: Developed by the Truckee River Basin Recovery Implementation Team for the U.S. Fish and Wildlife Service.
- U.S. Fish and Wildlife Service. 2005. Coordination Act Report. McCarran Ranch, Truckee River: Section 1135 Project Modifications for Improvement of the Environment. Washoe and Storey Counties, Nevada. Prepared for the Sacramento District, U.S. Army Corps of Engineers. 2005-04-07.
- U.S. Fish and Wildlife Service. 2005. Species Assessment and Listing Priority Assignment: U.S. Fish and Wildlife Service.
- U.S. Fish and Wildlife Service. 2006. Species List for the Lower Truckee River Restoration Projects, Washoe and Storey Counties, Nevada. File No. 1-5-07-SP-026.
- U.S. Fish and Wildlife Service Bald Eagle Monitoring Team. 2007a. Draft Post-Delisting Monitoring Plan for the Bald Eagle (*Haliaeetus leucocephalus*): U.S. Department of Fish and Wildlife.
- U.S. Fish and Wildlife Service. 2007b. National Bald Eagle Management Guidelines: U.S. Fish and Wildlife Service
- Service, U.S. Fish and Wildlife. 2008. Species Account. Yellow-billed Cuckoo [on-line document], October 21, 2007 [Viewed March 2008].
- Washoe County Air Quality Management Division (AQMD). 2006. Washoe County, Nevada Air Quality Trends 1995- 2006.
- Washoe County. 1994. Comprehensive Plan. May 24, 1994.
- Washoe County. 2004. Washoe County Development Code. Article 414 Noise and Lighting Standards. Section 110.414.20. May 11, 2004.
- Weatherbase. 2007. Weather Records and Averages. Available on the Internet at: <http://www.weatherbase.com/weather/weather.php3?s=796762&refer>.
- Wesnousky, Steven G. 2005. The San Andreas and Walker Lane Fault Systems, Western North America: Transpression, Transtension, a Cumulative Slip and the Structural Evolution of a Major Transform Plate Boundary. Center for Neotectonic Studies, University of Nevada, Reno. January 2005.
- Whitney, Bill. 2007. Senior Planner, Washoe County. Personal Communication, June 2007.