Environmental impacts are determined by carefully evaluating the most probable future conditions of an area due to implementation of a proposed project. The CEQA Guidelines state that the impacts of a proposed project that are analyzed in an environmental review document must be related to a physical change (CEQA Guidelines Section 15358[b]). The CEQA Guidelines use the terms "impact" and "effect" synonymously and distinguish the difference between those that are direct and those that are indirect. Direct impacts are "caused by (a) project and occur at the same time and place" (CEQA Guidelines Section 15358[a][1]). An example would be the air emissions that would result from construction and operation of a proposed industrial facility. Indirect impacts are impacts "which are caused by (a) project and are later in time or farther removed in distance, but are still reasonably foreseeable" (CEQA Guidelines Section 15358[a][2]). An example of indirect impacts would be the effects of population growth that could occur due to a change in a community's existing land use patterns.

The focus of this section is on the potential direct and indirect impacts of the proposed project on biological resources, water resources, cultural and paleontological resources, and recreation. Direct and indirect impacts that would be associated with the project's alternatives are discussed in Section 4. A summary of environmental effects that would be less than significant is provided in Section 5. Section 6 identifies the environmentally preferred alternative, and Section 7 provides an evaluation of the project's long-term implications, including growth inducing impacts, cumulative impacts, and irreversible environmental changes.

3.1 BIOLOGICAL RESOURCES

3.1.1 Introduction

The proposed project would simulate the natural hydrologic regime of middle Piru Creek for the purpose of avoiding "incidental take" of the arroyo toad (*Bufo californicus*), a federally endangered species. The proposed project would also:

- Reduce the presence of invasive aquatic predators, including largemouth bass (*Micropterus salmoides*), bullfrog (*Rana catesbeiana*) and crayfish (*Procambarus clarkii*), that are known to prey on arroyo toad
- Reduce the amount of riparian and wetland vegetation that is artificially supported by the current regulated flow regime and that adversely affects arroyo toad habitat
- Provide for natural stochastic events required for the recruitment and maintenance of natural riparian vegetation and the establishment of arroyo toad breeding habitat (i.e. periodic flooding, scour, and variable water surface elevations)
- Improve habitat conditions for other native species, including the southwestern pond turtle (*Clemmys marmorata*).

Simulating natural flows in middle Piru Creek would provide the dynamic fluvial processes required to maintain natural stream channel morphology and floodplain habitat characteristics favorable to native species such as the arroyo toad. Flow modification is one of the most widespread human disturbances to riparian ecosystems, yet the effects of altered stream hydrology are not well understood (Bain et al., 1988). On many regulated rivers and streams, prescribed flow regimes are intended to support fishery resources, channel maintenance, and water delivery while providing minimal base flows needed to support other aquatic organisms. However, stream conditions that may be favorable for one species may result in detrimental conditions for others. The imposition of artificial stream flows, including the attenuation of storm events and the augmentation of summer stream flow, has the potential to alter substantially the ecological composition of the system. Flooding and regular scour by storms are forms

of disturbance to which many plant and animal species appear well adapted and are often required for the development of suitable nesting or breeding habitat for some species (Busch and Smith, 1995). On Piru Creek construction of Pyramid Dam has altered historic stream flows, limited the magnitude of some winter storms, and blocked the transport of sediment below the dam. This has altered the composition and structure of riparian communities downstream of the dam and is adversely affecting the arroyo toad.

Arroyo toads are extreme habitat specialists and require a unique combination of physical and biological factors for successful breeding and survival (Sweet, 1992). Since the completion of the dam in 1973, middle Piru Creek has been subject to an altered hydrologic regime. Regulated flows have contributed to the reduction of downstream sediment transport; increased populations of species that prey on arroyo toads, such as bull frog and largemouth bass; resulted in the encroachment of riparian and wetland vegetation onto arroyo toad breeding habitat; and supported a non-natural flow regime that negatively affects arroyo toad and other sensitive native aquatic species.

General Site Conditions

This section describes the current biological conditions present along middle Piru Creek and is based on the following information:

- Species known to occur within the planning area, based on historic range and field observations
- Species likely to occur within the planning area, based on the distribution of the species and habitat suitability
- Species that could be affected by the proposed project, because of their presence in areas adjacent to the proposed project area
- Initial Study/Mitigated Negative Declaration for the Piru Creek Erosion Repairs and Bridge Seismic Retrofit Project (Aspen, 2003a)
- Biological Evaluation and Biological Assessment for the Piru Creek Erosion Repairs and Bridge Seismic Retrofit Project (Aspen, 2003b)

Lists of plant and animal species considered in this analysis were based upon:

- Initial Study/Negative Declaration for the Piru Creek State Water Release Project (United, 2002)
- Aerial photographs of Piru Creek (United, 2004)
- Aerial photographs of select areas of Piru Creek (Air Photo USA, 2004)
- Results of focused sensitive vegetation and wildlife studies conducted in middle Piru Creek below the dam by Aspen biologists in 2003 and 2004
- Reconnaissance surveys conducted by CDWR on Piru Creek in 2002 and in March, April, and May 2004.
- California Department of Fish and Game California Natural Diversity Database, USGS Quads for Black Mountain, Liebre Mountain, Cobblestone Mountain, and Whitaker Peak (2004).
- The Pacific Southwest Regional Forester's List of sensitive plants and animals for the Angeles National Forest (2003).
- Results of creel census surveys conducted by CDWR on Middle Piru Creek between Frenchman's Flat and the Pyramid Dam Bridge (2003-2004) (see Appendix C).

3.1.2 Environmental Setting

Vegetation

Plant and wildlife species in the proposed project area are typical of the transverse ranges of southern California and are adapted to a Mediterranean climate with cool wet winters and hot dry summers. Rainfall occurs primarily between October and March. State Water Project weather information indicates that Pyramid Lake receives approximately 12.72 inches of annual rainfall at the dam (CDWR, 2003a). The mountain headwaters of Piru Creek (located northwest of Pyramid Lake) receive snow during cold winter storms; the area may also get rain during the summer for short but intense periods of time as a result of periodic monsoons. Except in the driest years, climatic conditions generally support perennial flows in upper Piru Creek. During periods of reduced rainfall, middle Piru Creek would not always support perennial flows, especially during dry summer months. A review of pre-dam USGS stream gauge data for Piru Creek indicates that while flow was recorded in upper Piru Creek, little or no flow was recorded above Lake Piru during the same period. In addition, under existing conditions between 35 and 50 percent of water released from Pyramid Dam is not recorded at the stream gauge above Lake Piru during summer months. This water is lost through a combination of natural processes including ground water re-charge, evapotranspiration from riparian vegetation, and evaporation as surface water flows the 18-mile length of middle Piru Creek. This climate and changing stream conditions provides for a variety of plant communities that support diverse animals. Middle Piru Creek supports a variety of riparian plant communities primarily dominated by dense stands of willows (*Salix* spp.) and cottonwoods (*Populus fremontii*). As a result of creek morphology and historic scouring, localized stands of vegetation dominated by one species of willow also occur including early successional stages of sand bar willow (*Salix exigua*) and isolated communities of arroyo willow (*Salix lasiolepis*). Other common riparian trees and shrubs occasionally found along middle Piru Creek include white alder (*Alnus rhombifolia*), elderberry (*Sambucus mexicana*), and western sycamore (*Platanus racemosa*). Cattails (*Typha* sp.), sedges (*Carex* sp.), and rushes (*Juncus* sp.) dominate the lower banks of middle Piru Creek and have colonized many in-stream sandbars and benches. Concrete-lined channels, rock riprap, and concrete weirs occur at several locations below the dam, and a concrete Arizona crossing bisects middle Piru Creek at the Blue Point Campground near creek mile 17 (see Figures 2-2 and 2-3 for creek mile locations).

The uplands surrounding middle Piru Creek are equally diverse. In some areas oaks (*Quercus* sp.) occur in adjacent upland habitat; in other areas sage scrub and chaparral communities dominate. Where sharp changes in topography occur and the creek narrows, chaparral communities consisting of chamise (*Adenostoma fasciculatum*), ceanothus (*Ceanothus crassifolius*), black and purple sage (*Salvia mellifera* and *S. leucophylla*), and scrub oak (*Quercus berberidifolia*) abut the creek. Other common species include mountain-mahogany (*Cercocarpus betuloides* var. *blancheae*), white sage (*Salvia apiana*), and hollyleaf cherry (*Prunus ilicifolia*). Low scrubs and herbaceous plants including buckwheats (*Eriogonum* spp.) and yucca (*Yucca whipplei*) dominate slopes in rocky, loose, or exposed areas. Blazing star (*Mentzelia laevicaulis*) and chalk live-forever (*Dudleya pulverulenta* var. *pulverlenta*) are occasionally present in rocky crevices on exposed and rocky slopes. In some areas middle Piru Creek flows through narrow rock strewn gorges that support little, if any, vegetation. Further from the creek channel, disturbed non-native grasslands historically subject to grazing occur. Pine forests dominated by Jeffery pines (*Pinus jefferyi*) are located on some of the surrounding peaks.

Several plant communities occur in or near the creek including:

- Southern willow scrub
- Riparian scrub
- Southern cottonwood riparian forest
- Mulefat scrub
- Alluvial scrub
- Southern sycamore alder riparian woodland
- Southern coast live oak riparian forest
- Marsh
- Coastal Sage scrub
- Chaparral
- Non-native grassland
- Oak woodland
- Disturbed.

These plant communities were identified using aerial photographs and field reconnaissance by Aspen Environmental Group (2003 and 2004).

Southern Willow Scrub

Southern willow scrub is the dominant plant community in middle Piru Creek and occurs at many different locations along the length of the creek. Willow scrub is dominated by a mixture of willows and mulefat (*Baccharis salicifolia*), and includes shrub species such as poison oak (*Toxicodendron diversilobum*) and the invasive non-native Spanish broom (*Spartium junceum*) (Holland, 1986). In some areas almost pure stands of sandbar willow abut the creek with small populations of white alder and an occasional cottonwood. Southern willow scrub is also present along the historically dry braided channels of alluvial floodplains near creek miles 16 and 17 (see Figure 2-3), which were previously subject to periodic scour from severe winter storms.

Riparian Scrub

Riparian scrub communities on the bars and banks of river channels generally require seasonal flooding and are dominated by trees and shrubs. To a lesser extent this community may also occur in floodplain areas. It consists of newly emerging willows including sand bar willow and arroyo willow, mulefat, and cottonwood. In addition, Mexican elderberry (*Sambucus mexicanus*) and Fremont cottonwood are also known to occur in this habitat type. Scrub communities intergrade with southern willow scrub and southern cottonwood forest at many locations along middle Piru Creek. Specifically, these areas occur along the narrow creek gorges where periodic disturbance occurs more frequently due to the constricted creek channel. In addition, scrub communities have developed along sections of the creek as a result of summer flow supplied by controlled releases from the dam.

Southern Cottonwood Willow Riparian Forest

Mature cottonwoods and willows dominate southern cottonwood willow riparian forests (Faber and Keller, 1985), which can have an open or closed canopy that is generally greater than 20 feet in height and requires a persistent water source (Holland, 1986). Along middle Piru Creek this habitat occurs in several locations including below the dam to Frenchman's Flat and above Bluepoint Campground. Below the dam mature cottonwoods and willows are co-dominant; the cottonwood canopy is often over 30 feet in height. Sycamores (*Platanus racemosa*) occur occasionally along this section of the creek including areas that are rarely flooded. Dense thickets of understory vegetation are common in this area and include juvenile willows, mulefat, mugwort (*Artemisia douglasiana*), western ragweed (*Ambrosia psilostachya* var. *californica*), and stinging nettle (*Urtica dioica* ssp. *holosericea*). White clover (*Melilotus alba*) and non-native brome grasses (*Bromus* spp.) are other common species. Although outwardly robust in appearance, this community lacks age structure with few if any juvenile

cottonwoods. This is probably due to the lack of regular disturbance and the atypical persistent summer flows. Similarly, sustained summer water appears to have led to encroachment of riparian vegetation into the creek channel and the recruitment of understory willows and plants. The development of a dense riparian understory and thick accumulation of leaf litter prevents the establishment of cottonwood seedlings by preventing access to bare soil and providing excessive shading.

Mulefat Scrub

Mulefat scrub is an open to dense scrub community dominated by mulefat, coyote brush (*Baccharis pilularis*), white clover, black mustard (*Brassica nigra*), and western ragweed. Other species include willows, stinging nettle, and scale broom (*Lepidospartum squamatum*). Along middle Piru Creek this community occurs in drier portions of the creek bank, ephemeral drainages, and sections of the floodplain that are not subject to regular flooding. Invasive species such as tree tobacco (*Nicotiana glauca*), Spanish broom, and non-native grasses are common in this community. In some areas, coastal sage scrub or chaparral intergrades into scrub.

Alluvial Scrub/Terraces

Alluvial scrub communities occur in several locations where the creek canyon widens and has a relatively flat streambed. Historically these areas supported braided or meandering channels that often shifted across the floodplain as a result of hydrologic events. Vegetation consists of a mix of riparian and upland species that colonized that area since the last flood. Mature cottonwoods and willows also occur in this habitat and often delineate the location of the historic stream channel. At several locations along middle Piru Creek, alluvial scrub habitats have sparse vegetation and are composed of flood deposits of cobbles, boulders, and coarse sand. There are few herbaceous plants on the lower terraces due to the historic flow regime of the creek and shading by riparian trees. Non-native brome grasses, California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), California sagebrush (*Artemisia californica*), scale broom, California cudweed aster (*Lessingia filaginifolia* var. *filaginifolia*), and California brickellbush (*Brickellia californica*) are common in this area. Upper terraces are crossed by trails and dirt access roads and dominated by non-native grasses with isolated cottonwoods and small populations of yerba santa (*Eriodictyon crassifolium* var. *crassifolium*) and summer mustard (*Hirschfeldia incana*). Above Bluepoint Campground alluvial scrub habitat is well developed and contains a mosaic of riparian scrub and coastal sage scrub communities. Dense thickets of sandbar willow and mulefat together with isolated willow and cottonwood trees intergrade with scale broom, yucca, and yerba santa. Invasive species such as brome grasses, Spanish broom, and mustard are common in these areas.

Southern Sycamore Alder Riparian Woodland

Southern sycamore alder riparian forests typically occur along seasonally flooded streams and rivers below 6,000 feet. This community is dominated by tall, open, broad-leaved, winter-deciduous species including sycamore and white alder (Holland, 1986; Faber and Keller, 1985). Oak trees may occur in adjacent upland areas that are not subject to regular inundation. Alder communities are restricted to perennial waterways, and their roots require access to ground water to persist. With limited disturbance alders may form dense monocultures along streams and rivers. This community occurs in limited areas along middle Piru Creek; however, dense stands of alders have developed along portions of the creek above and below Bluepoint Campground between creek mile 17 and 18.

Southern Coast Live Oak Riparian Forest

Southern coast live oak riparian forest is limited to a few tributaries and ephemeral drainages to middle Piru Creek. This community is dominated by a closed canopy formation of mature oak trees with an understory of poison oak and blackberry (*Rubis ursinus*) (Holland, 1986). Herbaceous species include non-native grasses, horehound (*Marrubium vulgare*), and miner's lettuce (*Claytonia perfoliata* var. *perfoliata*). California bay (*Umbellularia californica*), willows, and mulefat are other common species that occur in this community.

Marsh

Marsh communities are characterized by erect, rooted, herbaceous hydrophytes. These areas are typically dominated by monocots such as cattails (*Typha latifolia*), sedges (*Carex* spp.), and bulrush (*Scirpus* ssp.). Other common species include water speedwell (*Veronica anagallis-aquatica*), lady's thumb (*Polygonum* spp.), rabbit's foot grass (*Polypogon monspeliensis*), and watercress. Marsh communities occur at numerous locations along the length of middle Piru Creek. South of the dam, marsh communities occur at Piru ponds (creek mile 1.5), a now isolated oxbow of the creek near the access road that leads to the north maintenance entrance of the Angeles Tunnel. Marsh plants also have colonized many of the sandy benches and riverbanks located along the banks of the creek with dense monocultures of cattails (creek miles 2, 15, and 17). The colonization and expansion by wetland vegetation is particularly evident along the downstream sections of the creek near Bluepoint Campground. In recent years the recruitment of wetland vegetation has increased, and cattails now dominate many sections of the creek that once supported sparsely vegetated sandy benches, gravel bars, and terraces. This may be the result of augmented summer flows.

Upland Communities

Upland plant communities include vegetation dominated by plant species that do not require a permanent source of water, as opposed to plant species that are adapted to areas that are either seasonally flooded or have saturated soils for at least a portion of the growing season. Generally, upland plant communities consist of plant species that are adapted to dryer conditions and typically require only seasonal precipitation to obtain adequate water resources for growth and reproduction. Although most of the proposed project area is occupied by riparian habitats, several upland plant communities do occur, for example, on elevated terraces in the floodplain or immediately adjacent to the creek edge.

Coastal Sage Scrub

Coastal sage scrub communities are characterized by low growing, drought tolerant shrub species. In the proposed project area these communities are dominated by stands of California buckwheat, California sagebrush, and California bush sunflower (*Encelia californica*). Other common species include California fuchsia (*Epilobium canum* ssp. *canum*), white sage, chaparral nightshade (*Solanum xantii* var. *xantii*), and yucca (*Yucca whipplei* ssp. *whipplei*). Purple sage, bush monkey flower (*Mimulus aurantiacus*), and non-native grasses may also be present.

Scrub plant size and species composition is relative to the available water supply present at each site; however, these semi-woody plants are typically low growing since drought seasons accompanied with high temperatures and drying winds cause severe moisture stress during summer months (Zedler et al., 1997). Scrub species form various canopy densities and occupy shallow or heavy soils on dry predominantly southern-facing slopes. Some larger evergreen shrubs, typically categorized as chaparral species, such as ceanothus (*Ceanothus* spp.) and sugar bush (*Rhus ovata*), are also often observed as

emergent shrubs within coastal sage scrub communities. Coastal sage scrub occurs in many areas adjacent to middle Piru Creek and is prominent in alluvial scrub communities and on some of the dry stream terraces.

Chaparral

Chaparral communities are dominated by evergreen shrubs with small, thick, leathery, dark green, sclerophyllous leaves. The shrubs are typically rather tall and dense and are adapted to periodic wildfires by stump sprouting or by germination from a dormant seed bank. These evergreen shrubs are also adapted to drought by deep extensive root systems, while their small thick leaf structure prevents permanent damage from moisture loss (Zedler et al., 1997). Many typical coastal sage scrub species also grow intermixed as associates with chaparral species. Chaparral typically occurs on moderate to steep south facing slopes with dry, rocky, shallow soils and becomes more abundant at higher elevations where temperatures are lower and moisture supplies are more ample.

Dominant species observed in chaparral communities along middle Piru Creek include chamise (*Adenostoma fasciculatum*), bigberry manzanita (*Arctostaphylos glauca*), and hollyleaf cherry. California sagebrush, coyote brush, ceanothus, mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), and yerba santa are other common species. California buckwheat, toyon (*Heteromeles arbutifolia*), and chaparral bush mallow (*Malacothamnus* sp.) are also present but to a lesser extent. In some areas of middle Piru Creek, the adjacent hillsides are dominated by chamise chaparral; this is a needle-leaved, evergreen shrub that is the most abundant species in non-desert shrublands of California. Chamise is the most common chaparral type throughout California and is widespread along middle Piru Creek. It is adapted to California's Mediterranean climate by a dual root system with both deep and shallow roots; individuals recover from fire by both resprouting and seedling recruitment. Chamise is usually associated with drier steep to gradual south and west-facing slopes and ridges; it also occurs on xeric slopes on very shallow soils at elevations below 4,500 feet (Zedler et al., 1997).

Non-Native Grassland

Non-native grassland communities consist of predominantly low-growing herbaceous and invasive vegetation that forms either a continuous ground cover on open hillsides and terraces or understory patches below emergent shrubs and woodlands. Many native flowering annual herb and perennial bulb species (wildflowers), as well as naturalized annual forbs and invasive exotics, are important components of grassland communities.

Grasslands typically occur in well-developed, deeper, fine textured soils on gentle slopes and flats, coastal terraces, and disturbed sandy sites. Areas dominated by grasses are often in early successional stages. Over time, grasslands tend to revert back to shrublands and eventually even to woodlands if burning and disturbance frequencies are minimal (Zedler et al., 1997). The predominant nonnative annual grasses identified in the middle Piru Creek area include slender wild oat (*Avena barbata*), cultivated oak (*Avena sativa*), ripgut brome, soft chess (*Bromus hordeaceus*), red brome (*Bromus madritensis* ssp. *rubens*), Mediterranean grass (*Schismus barbatus*) and foxtail fescue (*Vulpia myuros*). The non-native perennial grasses observed in the proposed project area include Bermuda grass (*Cynodon dactylon*) and smilo grass. Native herbaceous species observed include western ragweed, evening primrose (*Camissonia* spp.), wild forget-me-not (*Cryptantha* spp.), dove weed (*Eremocarpus setigerus*), telegraph weed (*Heterotheca grandiflora*), and California cudweed aster. Parish lotus (*Lotus parishianus* var. *purshianus*), lupine (*Lupinus* spp.), and sticky phacelia (*Phacelia viscida* var. *viscida*) are present but to a lesser extent. Non-native weedy species are common and dominated by summer

mustard, tocalote (*Centaurea melitensis*), Russian thistle (*Salsola tragus*), and milk thistle (*Silybum marianum*).

Non-native grasslands are common along the length of middle Piru Creek; they are especially common on gradual slopes, meadows, stream terraces, and disturbed sandy sites. In some areas non-native grasses dominate the understory of both riparian and oak woodlands and contribute to the scrub and chaparral plant communities as well.

Disturbed Habitat

Disturbed plant communities, also known as ruderal communities, are dominated by herbaceous, introduced, pioneering plant species that readily colonize open disturbed soil and thrive as a result of human impacts. Ruderal communities may provide a certain degree of erosion control for recently disturbed or graded areas, but such communities are also a threat to the natural biodiversity of an area. Invasive species continually distribute highly competitive propagules into otherwise native vegetation; however, if ruderal grassland stands remain undisturbed for more than five years they can undergo succession towards more stable and less weedy plant communities, such as coastal or riparian scrub (Zedler et al., 1997).

Disturbed habitat occurs at several locations along middle Piru Creek, including Frenchman's Flat and the historic Whitaker Ranch area above Lake Piru (creek mile 16.5). Disturbed habitat also occurs along the access roads into Bluepoint Campground. These areas are dominated by summer mustard, black mustard (*Brassica nigra*), tocalote, and Russian thistle. Some of the non-native and often invasive herbs scattered throughout these areas include tumbling pigweed (*Amaranthus albus*), scarlet pimpernel (*Anagallis arvensis*), mayweed (*Anthemis cotula*), pineapple weed (*Chamomilla suaveolens*), Italian thistle, Mexican tea (*Chenopodium ambrosioides* var. *ambrosioides*), red stem filaree (*Erodium cicutarium*), and sweet fennel (*Foeniculum vulgare*). Prickly lettuce (*Lactuca serriola*), horehound (*Marrubium vulgare*), bur-clover (*Medicago polymorpha*), and wild radish (*Raphanus sativa*) are other common weeds identified along middle Piru Creek.

Special Status Plants

Table 3.1-1 lists federally and State listed species, USFS "Sensitive Plant" species, and plants identified as Sensitive List 1B by the California Native Plant Society (CNPS) that may occur in or near the proposed project area. A record search using the California Natural Diversity Database (CNDDB) was conducted for special status plant species, and vegetation community surveys were conducted along sections of middle Piru Creek above Frenchman's Flat and in the vicinity of Bluepoint Campground (Aspen, 2003a, 2004 and CDWR 2003) that recorded all plant species observed.

Wildlife

Riparian communities support some of the most diverse assemblages of wildlife and provide access to water, shade, and protection from predation. These areas also provide foraging habitat and are used for nesting and breeding by a number of species. The diverse riparian and upland community types that occur in and adjacent to middle Piru Creek provide habitat for a variety of resident and migratory wildlife species including several special status species. Of particular importance are riparian areas that provide habitat for several special status species including habitat for the federally endangered arroyo toad (USFWS, 2001). In addition, the creek bed and adjacent riparian habitat function as a movement corridor for a number of wildlife species. The upland vegetation communities that occur in and adjacent to middle Piru Creek (e.g., coastal sage scrub and chaparral) also support a wide variety of species and contribute to the overall wildlife species diversity.

Table 3.1-1 Endangered, Threatened, and Sensitive Plant Species with the Potential to Occur in the Vicinity of Middle Piru Creek

Common Name	Scientific Name	Status	Habitat Association in Proposed Project Region	Known or Potential Occurrence in Proposed Project Area
Forest camp sandwort	*Arenaria macradenia var. kuschei*	FE	Habitat and elevation range unknown. Flowers June and July	Not observed during botanical surveys of the proposed project area (2002 and 2003).
Braunton's milk-vetch	*Astragalus brauntonii*	FE, SE, 1B	Chaparral, coastal scrub, valley floor grasslands, closed-cone conifer forest, recent burns or disturbed area, carbonate soils, <1500 feet in elevation	Not observed during botanical surveys. Suitable habitat occurs in the proposed project area. Four metapopulations are known to occur in Ventura, Los Angeles and Orange Counties.
Crested milk-vetch	*Astragalus bicristatus*	FSS	Open, rocky areas in pine forest, elevation 5,500-8,200 feet	This species is not known to occur in the proposed project area. Not observed during the 2002 and 2003 botanical surveys.
San Antonio milk-vetch	*Astragalus lentiginosus var. antonius*	FSS, 1B	Lower montane conifer forest, upper montane conifer forest, elevation 5,000-8,500 feet	This species is not known to occur in the proposed project area. Not observed during the 2002 and 2003 botanical surveys
Ventura marsh milk-vetch	*Astragalus pycnostachyu*s var. *lanosissimus*	FE, FSS	Marshes and swamps. Presumed extinct in California. (CNPS)	Suitable habitat does not occur in the proposed project area.
Nevin's barberry	*Berberis nevinii*	FE, SE, FSS, 1B	Sandy to gravelly soils, washes, chaparral, sage scrub. Flowers March and April, elevation below 2100 feet	Suitable habitat does occur in the proposed project area, but the species was not found during surveys conducted in 2002 and 2003.
Three-leaved brodiaea	*Brodiaea filifolia*	FE, SE, FSS, 1B	Grassland, vernal pools, elevation 200-1000 feet	Not observed during botanical surveys. Suitable habitat may occur in the proposed project area.
Palmer's mariposa lily	*Calochortus palmeri var. palmeri*	FSS, 1B	Chaparral, elevation 4,000-6,500 feet	Suitable habitat does occur in the proposed project area, but the species was not found during botanical surveys conducted in 2002 and 2003.
Plummer's mariposa lily	*Calochortus plummarae*	FSS, 1B	Dry rock, chaparral, yellow pine forest at elevations below 5,500 feet	Suitable habitat occurs in the project area. Not observed during the 2002 or 2003 botanical surveys of the proposed project area.
Alkali marsh mariposa lily	*Calochortus striatus*	FSS, 1B	Alkaline meadows, moist creosote-bush scrub, elevation 2,600-4,500 feet	Suitable habitat does not occur in the proposed project area.
Pygmy poppy	*Canbya candida*	FSS, 1B	Sandy Areas. Flowers March – June, elevation 2,000-4,000 feet	Not observed during the 2002 and 2003 botanical surveys of the proposed project area.
Mt. Gleason Indian paintbrush	*Castilleja gleasonii (=Castilleja pruinosa)*	FSS, 1B	Dry, open serpentine or forest edge, 1,600-6,500 feet in elevation	May occur in the project area. Not observed during the 2002 and 2003 botanical surveys.
Peirson's spring beauty	*Claytonia lanceolata var. peirsonii*	FSS, 1B	Gravelly soils, woodlands, meadows, elevation 3,500-8,500 feet	Suitable habitat does not occur in the proposed project area.

Common Name	Scientific Name	Status	Habitat Association in Proposed Project Region	Known or Potential Occurrence in Proposed Project Area
Slender-horned spineflower	*Dodecahema (=Centrostegia) leptoceras*	FE, FSS, 1B	Coastal scrub, alluvial sands between 650-2,300 feet in elevation	Suitable habitat may occur in the proposed project area
Many-stemmed dudleya	*Dudley multicaulis*	FSS, 1B	Coastal Plain, heavy soils often containing clay, below 2,000 feet	Suitable habitat may occur in the proposed project area.
Southern alpine buckwheat	*Eriogonum kennedyi var. alpigenum*	FSS, 1B	Subalpine conifer forest, alpine boulder and rock field, dry, granitic and gravel substrates, elevation 8,500-11,500 feet	Suitable habitat does not occur in the proposed project area.
Johnston's buckwheat	*Eriogonum microthecum var. johnstonii*	FSS, 1B	Subalpine conifer forest, upper montane conifer forest, rocky substrates, elevation 2,600-2,900 meters	Suitable habitat does not occur in the proposed project area.
Pine green-gentian	*Frasera neglecta (=Swertia neglecta)*	FSS	Lower montane conifer forest, pinyon juniper woodland, elevation 4,600-8,200 feet	Suitable habitat does not occur in the proposed project area.
San Gabriel bedstraw	*Galium grande*	FSS, 1B	Open broad-leafed forest; chaparral. Flowers January – July, elevation 1,500-5,000 feet	Potential habitat exists in the region, but this species is known only from a few occurrences, most thought to be in Los Angeles County near the San Gabriel Mountains.
Lemon lily	*Lilium parryi*	FSS, 1B	Meadows, streams in montane coniferous forest, elevation 4,300-8,500 feet	Suitable habitat does not occur in the proposed project area. Not observed during the 2002 or 2003 botanical surveys of the proposed project area.
San Gabriel linanthus	*Linanthus concinnus*	FSS	Lower montane conifer forest, upper montane conifer forest, dry rocky slopes, elevation 5,600-9,200 feet	Suitable habitat does occur in the proposed project area; however, no plants were identified during the 2003 botanical surveys.
Hall's monardella	*Monardella macarantha ssp. halli*	FSS, 1B	Chaparral, woodland forest. Flowers June – August, elevation 2000-6,500 feet	Suitable habitat may occur. Not observed during the 2002 and 2003 botanical surveys of the proposed project area.
Rock monardella	*Monardella viridis ssp. saxicola*	FE, FSS	Montane, chaparral, conifer forest. Flowers June – September, elevation 1,600-5,900 feet	Suitable habitat may occur. Not observed during the 2002 and 2003 botanical surveys of the proposed project area.
Baja navarretia	*Navarretia peninsularis*	FSS, 1B	Lower montane conifer forest, mesic, areas in open forest, elevation 4,900-7,500 feet	Suitable habitat does not occur in the proposed project area.
Short-joint beaver tail	*Opuntia basilaris var. brachyclada*	FSS, 1B	Chaparral, elevation 4,000-5,900 feet	Suitable habitat does not occur in the proposed project area.
California orcutt grass	*Orcuttia californica*	FE, SE, 1B	Vernal pools	Suitable does not occur in the proposed project area.

Common Name	Scientific Name	Status	Habitat Association in Proposed Project Region	Known or Potential Occurrence in Proposed Project Area
Howell's broomrape	*Orobanche valida spp. valida*	FSS, 1B	Chaparral, pinyon juniper woodland, dry, rocky slopes, at elevations 4,500-6,500 feet	Suitable habitat does not occur in the proposed project area.
Lyon's pentachaeta	*Pentachaeta lyonii*	FE, 1B	Chaparral (openings), valley floor grasslands	Not observed during botanical surveys. Suitable habitat may occur in the proposed project area.
Gambell's watercress	*Rorippa gambellii*	FE, FSS, 1B	Marshes, streambanks, lake margins. Flowers April – June. Generally below 4,500 feet	May occur in project area, but not observed during the 2002 and 2003 botanical surveys of the proposed project area.

Sources: CNDDB (2003); USFW Sensitive Plant Species List (2002); CDWR (2003b); CDWR IS/MND for Piru Creek Erosion Repairs and Seismic Retrofit Project 2003
FT = Federally Threatened Species FE = Federally Endangered Species
SE = State Endangered Species FSS = USFS Sensitive Species
CNPS 1B = Plants identified as rare or endangered in California and elsewhere

Several studies have been conducted that document wildlife occurrences within the proposed project area. Least Bell's vireo studies conducted for the USFS (Jones and Stokes, 2002) identified over 110 bird species along middle Piru Creek. In addition, protocol level surveys for sensitive birds and reconnaissance level wildlife surveys conducted by the CDWR (CDWR, 2003 and 2004) have identified over 150 vertebrate species at locations throughout the proposed project area.

Birds

Bird species common to middle Piru Creek include American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), turkey vulture (*Cathartes aura*), western scrub jay (*Aphelocoma coerulescens*), and California towhee (*Pipilo crissalis*). Shore birds have also been observed foraging in middle Piru Creek and include green heron (*Butorides virescens*), snowy egret (*Egretta thula*), American bittern (*Botaurus lentiginosus*), and black-crowned night heron (*Nycticorax nycticorax*). Mallard (*Anas platyrhyncos*), American coot (*Fulica americana*), and killdeer (*Charadruis vociferous*) were also observed in the creek. Other species identified within the proposed project area include red-tailed hawk (*Buteo jamaicensis*), California quail (*Callipepia californica*), warbling vireo (*Vireo gilvus*), and phainopepla (*Phainopepla nitens*).

Several sensitive birds may have the potential to occur in the proposed project area and include California condor (*Gynmogyps californianus*), southwestern willow flycatcher (*Empidonax trailli extimus*), and least Bell's vireo (*Vireo belli pusillus*).

Mammals

The isolated location of middle Piru Creek in the Los Padres and Angeles National Forests provides a rich environment for a wide variety of mammals. Common mammals identified in middle Piru Creek include raccoon (*Procyon lotor*), California ground squirrel (*Spermophilus beecheyii*), brush rabbit (*Sylvilagus bachmani*), striped skunk (*Mephitis mephitis*), coyote (*Canus latrans*), and mule deer (*Odocoileus hemionus*). In addition, the area is used by wide-ranging carnivores including black bear (*Ursus americanus*), bobcat (*Felis rufus*), and mountain lion (*Puma concolor*). Ringtail (*Bassariscus astutus*) and gray fox (*Urocyon cinereoargentus*) may also occur. Small mammals expected to occur in the proposed project area include such species as dusky-footed wood rats (*Neotomys fuscipes*), voles (*Microtus* spp.), and deer mice (*Peromyscus* sp.). The abundance of small mammals in the proposed

project area serves as an important prey base for raptors and larger mammals. Rocky canyons and boulder-strewn hillsides of the creek provide habitat for a number of bat species including western pipistrelle (*Pipistrellus hesperus*), big brown bat (*Eptesicus fuscus*), and Yuma bat (*Yuma myotis*), a federal species of special concern.

Amphibians and Reptiles

A variety of amphibians and reptile species are known or expected to occur along middle Piru Creek. Amphibians identified along middle Piru Creek include arroyo toad, Pacific treefrog (*Hyla regila*), western toad (*Bufo boreas*), bullfrog, and California treefrog (*Hyla cadaverina*). Reptiles present include species such as western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarinata*), side blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis melanoleucus*). Although not observed during surveys, king snake (*Lampropeltis getulus*) and western rattlesnake (*Crotalus viridis*) are expected to occur in many of the native natural communities along middle Piru Creek. Southwestern pond turtle (*Clemmys marmorata*) and the two-striped garter snake (*Thamnophis hammondii*), both State and federal species of special concern, were also observed at several locations along middle Piru Creek.

Fish

Historically several native fish species inhabited middle Piru Creek, including rainbow trout (*Oncorhynchus mykiss*), speckled dace (*Rhinichtys osculus*), arroyo chub (*Gila orcutti*), and Santa Ana River sucker (*Catostomus santaanae*) (Deinstadt et al., 1990). The unarmored three-spine stickleback (*Gasterosteus aculeatus williamsoni*), a small native fish, occurs in the Santa Clara River and may have once been part of the native fish assemblage of middle Piru Creek. In addition, prior to construction of the water diversions on the Santa Clara River and Santa Felicia Dam, middle Piru Creek may have supported a winter run of steelhead trout, an anadromous form of rainbow trout. However, with the exception of rainbow trout, surveys conducted by CDFG in 1987 did not detect the presence of native fish in middle Piru Creek (Deinstadt et al., 1990). Fish observed in middle Piru Creek during creel surveys conducted by CDWR in 2004 include rainbow trout and invasive predatory species such as bluegill (*Lepomis macrochirus*), green sunfish (*L. cyanellus*), largemouth bass (*Micropterus salmoides*), and catfish (*Ictalurus* spp.). Prickly sculpin (*Cottus asper*), a non-native fish, was also detected in middle Piru Creek by CDFG biologists in 1987.

Trout Fishery

As part of the license for the California Aqueduct, FERC requires the CDWR to maintain a year-round trout fishery in middle Piru Creek between Pyramid Dam and Frenchman's Flat. The water that is released into middle Piru Creek is intended to support a "catch and release" and a "put and take" trout fishery. The catch and release area is located between the Pyramid Dam Bridge and a small waterfall formed by a concrete weir near creek mile 1. The creek above the weir supports a naturally reproducing population of trout and is not stocked by the CDFG. In contrast, 3,000 pounds of hatchery-reared fish are released by CDFG per year below the weir between November and May.

Rainbow trout is one of the top sport fish in North America. It is cultured in many countries and is often hatched and stocked into rivers and lakes for recreational anglers. The native range of this species is the eastern Pacific Ocean and fresh water mainly west of the Rocky Mountains. This species occurs widely in many streams and lakes in California. It is unclear whether the potential for anadromous behavior is a truly genetic adaptation or simply an opportunistic behavior. It seems that any stock of rainbow trout is capable of migrating, or at least adapting to seawater, if the proper conditions or

opportunity arise. However, genetic studies of rainbow trout conducted in middle Piru Creek have indicated that existing populations of rainbow trout are not related to native steelhead, and that the existing trout population is related to hatchery reared fish (CDFG, 2004a). Therefore, it is not believed that anadromous forms of rainbow trout are present in middle Piru Creek.

The preferred habitat of this species is fresh water with temperatures in the near range of approximately 54°F (12°C) in summer. Rainbow trout require moderate to fast flowing, well-oxygenated waters for breeding, but they also live in cold lakes. Their life expectancy can be as low as three to four years, but their average life expectancy is 5 to 6 years. Their average length is 12 to 18 inches. Rainbow trout spawn from March to August in small streams where the female digs and spawns in several nests, depositing 800 to 1000 eggs in each group. The eggs hatch four to seven weeks later. Generally this species feeds close to the bottom. Adults feed on aquatic and terrestrial insects, mollusks, crustaceans, fish eggs, and minnows and other small fish (including other trout); young rainbow trout feed predominantly on zooplankton.

Sensitive Wildlife

Special status species include those listed as threatened or endangered under the federal or California Endangered Species Acts, species proposed for listing, species of special concern, and other species which have been identified by the USFWS, USFS, or CDFG as unique or rare and which have the potential to occur within the study area. There are currently 52 sensitive species (Table 3.1-2) that either occur or have the potential to occur within the proposed project area. However, only 12 of these species have the potential to be either closely associated with middle Piru Creek or affected by implementation of the proposed project and, therefore, warrant further discussion. These species include:

- Arroyo toad (Federally Endangered, California State Species of Special Concern)
- California red-legged frog (Federally Threatened, California State Species of Special Concern)
- Southwestern pond turtle (Federal and State Species of Special Concern, USFS Sensitive)
- Arroyo chub (State Species of Special Concern, USFS Sensitive)
- Two-striped garter snake (State Species of Special Concern, USFS Sensitive)
- California condor (Federal and State Endangered)
- Least Bell's vireo (State and Federally Endangered)
- Southwestern willow flycatcher (Federally Endangered)
- Western yellow-billed cuckoo (State Endangered)
- Yellow warbler (State Species of Special Concern)
- Great blue heron (CDFG Protected Species)
- Great egret (CDFG Protected Species).

Table 3.1-2 Known or Potentially Occurring Sensitive Wildlife in Middle Piru Creek

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Project Area
Fish				
Unarmored three-spine stickleback	*Gasterosteus aculeatus williamsoni*	FE	Aquatic-Riverine	Potential to occur - known from the Santa Clara River, of which middle Piru Creek is a tributary drainage. Surveys completed in the 1980s did not find this species (Deinstadt et al., 1990). Believed extirpated from middle Piru Creek.
Santa Ana sucker	*Castostomus sanatannae*	FT	Aquatic-Riverine	Potential to occur-known from the Santa Clara River, of which middle Piru Creek is a tributary drainage. Surveys completed in the 1980s did not locate this species in middle Piru Creek (Deinstadt et al., 1990). Historic records of presence above Bluepoint Campground, last observed in 1975 (CNDDB, 2003)
Santa Ana speckled dace	*Rhinichthys osculus*	FSC, FSS	Aquatic-Riverine	Potential habitat is present. However, surveys completed in the 1980s did not indicate the presence of this species in middle Piru Creek (Deinstadt et al., 1990).
Arroyo chub	*Gila orcutti*	FSS, CSC	Slow-moving warm streams in Southern California	Recorded in Piru Creek in 1965. Surveys completed in the 1980s did not detect the presence of this species (Deinstadt et al., 1990). This species is not expected to occur in middle Piru Creek.
Amphibians				
Arroyo toad	*Bufo californicus*	FE, CSC	Semi-arid regions, riparian habitats and intermittent steams, desert washes, with sandy streambeds with cottonwood, sycamore, and willow trees.	Known to occur along middle Piru Creek upstream of Bluepoint Campground and on Aqua Blanca Creek (CNDDB, 2004). Breeding occurred this year at several locations (Sandburg, 2004).
Mountain yellow-legged frog	*Rana muscosa*	FE, CSC	Restricted to southern California commonly inhabit streams at elevations ranging from 1,200- 7,000 feet	Historic record on Piru Creek in 1970 (CNDDB, 2003) Not observed during the May 2002 surveys conducted above Frenchman's Flat (CDWR, 2003c). Not expected to occur along middle Piru Creek at this time.
California red-legged frog	*Rana aurora draytonii*	FT, CSC	Aquatic-riverine, ponds, lakes, ephemeral drainages	This species may have been historically present along middle Piru Creek. Now present on Agua Blanca Creek (a tributary to Piru Creek) Not observed during the May 2002 protocol-level surveys conducted by CDWR above Frenchman's Flat. Possible larval sighting above Bluepoint Campground (Sandburg, 2004). Not expected to occur.
Foothill yellow-legged frog	*Rana boylii*	FSC, FSS, CSC	Aquatic-riverine, foothill yellow-legged frogs live in small, sometimes seasonal pools and slow-moving creeks, preferring regions with rocky cover. Commonly found in streams with rocky beds	Not observed during the May 2002 CRLF surveys conducted above Frenchman's Flat. Not believed to currently occur in middle Piru Creek. USFWS April 2, 2002 letter to CDWR indicated the proposed project area does not have critical habitat for this species and protocol-level surveys are not required. In addition, this species is not a federally threatened or endangered species, nor is it subject to critical habitat listing.
Yellow-blotched salamander	*Ensatina eschscholtzii croceater*	FSC, FSS, CSC, BLMS	Low to mid elevation riparian, mixed confer woodland, washes, canyons, and streams	Suitable habitat may occur in the proposed project area. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.
San Gabriel Mountain slender salamander	*Bastrachoseps gabrieli*	FSS	Only known from the San Gabriel Canyon, typically above 3,300 feet in elevation	Suitable habitat may occur in the proposed project region, but due to the restricted range of the species, it is not expected to occur in the proposed project area. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Project Area
Tehachapi slender salamander	*Bastrachoseps stebbinsi*	ST, FSS	Associated with oak or mixed pine-oak forests	Suitable habitat may occur in the larger proposed project region, but due to the restricted range of the species, it is not expected to occur in the proposed project area. Found only in the Caliente Creek drainage in the Piute Mountains, southern Sierra Nevada, Kern County, CA. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.
Reptiles				
Blunt-nosed leopard lizard	*Cabelia silus*	FE, SE	Prefers sparsely vegetated plains, alkali flats, low foothills, grasslands, canyon floors, large river washes and arroyos	Suitable habitat does not occur in the proposed project area. This species is presently found only in scattered locations in the San Joaquin Valley and the eastern portions of the Coast Ranges, including the Antelope and Carrizo Plains and Cuyama Valley. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.
Southwestern pond turtle	*Clemmys marmorata pallida*	FSC, FSS, CSC, BLMS	Aquatic-riverine, ponds, lakes with suitable basking areas	Known to occur along middle Piru Creek. Pond turtles identified at several locations below Pyramid Dam. Suitable habitat occurs at many locations along middle Piru Creek.
Two-striped garter snake	*Thamnophis hammondii*	FSS, CSC, BLMS	Occur in perennial and intermittent streams that have rocky beds and are bordered by willow thickets or other dense vegetation.	Known to occur along middle Piru Creek. This species was identified below the concrete weir and above Bluepoint Campground during reconnaissance surveys conducted in 2004. (Aspen, 2004)
San Diego horned lizard	*Phrynosoma coronatum blainvillii*	FSS, CSC	Inhabits coastal sage scrub, chaparral in arid and semi-arid climates. Prefers friable, rocky, shallow, sandy soils.	Suitable habitat occurs at several locations along middle Piru Creek. CNDDB (2004) record indicated the presence of this species at Frenchman's Flat Campground. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.
California legless lizard	*Aniella pulchra*	FSS	Fossorial species that constructs burrows in loose soil with a high sand fraction.	Suitable habitat may occur in the proposed project area. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.
San Bernardino ring-neck snake	*Diadophis punctatus modestus*	FSS	Prefers moist habitats including forests, grasslands, rocky wooded hillsides, chaparral, into upland desert along streams; sea level to ca. 7,000 feet	Suitable habitat may occur in the proposed project area. Found in northern San Diego County to Los Angeles County, east to San Bernardino Mountains. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.
Southern rubber boa	*Charina bottae umbratica*	FSS	Occurs in conifer forests near streams and meadows	Suitable habitat may occur in the proposed project area. Known from several localities in the San Bernardino Mountains in San Bernardino County, near Idyllwild in Riverside County, and on Mount Pinos in Kern County. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles above Frenchman's Flat.
Coastal rosy boa	*Lichanura trivirgata rosefusca*	FSS	Prefers a variety of desert and semi-desert habitats, rocky substrates, chaparral, hillsides, and canyons	Suitable habitat may occur in the proposed project area. Populations inhabit area south of High Grove, Allesandro Hills, Sage, Corn Springs, Hemet, Lakeview Mountains, Gavilan Hills, Eastside Reservoir, Santa Ana Mountain Foothills, and Aguanga. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Project Area
San Bernardino Mountain king-snake	*Lampropeltis zonata parvirubra*	FSS	The known elevations for this species extends from ca. 1,200 feet) to ca. 8,000 feet)	Suitable habitat does not occur in the proposed project area. Endemic to the San Gabriel, San Bemardino, and San Jacinto mountains of southern California. This species was not detected during CDWR (2003c) surveys for amphibians and reptiles conducted above Frenchman's Flat.
			Birds	
California condor	*Gynmogyps californianus*	FE, SE, DFGFP	Requires vast expanses of open savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Nests in cliffs. May forage up to 100 miles from nest and roost sites	Potential foraging habitat occurs in the proposed project area. CNDDB record from 1981 for the Redrock Mountain and Sespe-Piru Condor Area, USFS lands. Surveys conducted in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
Bald eagle	*Haliaeetus leucocephalus*	FT, SE, DFGFP	Winters at lakes, reservoirs, river systems, and some rangelands and coastal wetlands. Breeding habitats include mountainous regions near reservoirs, lakes and rivers.	Potential habitat occurs in the proposed project area. No occurrences were recorded in the CNDDB for the proposed project area. Surveys conducted in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE	Obligate riparian species that breeds along rivers, streams, wetlands, and other aquatic-associated habitats such as extensive riparian woodlands with water-filled creeks, or channels and scattered overgrown clearings	Potentially suitable habitat occurs in the proposed project area. Twelve non-breeding willow flycatchers were observed within the proposed project area during protocol-level surveys conducted during the spring and summer of 2002 (Jones and Stokes, 2002). Two non-breeding flycatchers were identified below Pyramid Dam in May 2004. No nesting or breeding behavior was observed (Aspen, 2004) One possible nesting pair observed by USFS above Lake Piru in 2002. Not observed in 2004.
Least Bell's vireo	*Vireo bellii pusillus*	FE, SE	For breeding, least Bell's vireos prefer riparian woodlands that combine a dense understory with a tall canopy. Their small cup-shaped nests are made from plant material and are typically placed on slender branches approximately two or three feet above the ground.	Potentially suitable habitat occurs in the proposed project area. No least Bell's vireos were detected above Frenchman's Flat during the spring and summer of 2002 (Jones and Stokes, 2002; Aspen, 2004). Possible nesting vireo pair located above Bluepoint Campground (USFS, 2004)
Coastal California gnatcatcher	*Polioptila californica californica*	FT, CSC	Coastal sage scrub plant community, occasionally chaparral	Potential habitat occurs in the project region. USFWS designated Critical Habitat in April 2003; however, this did not include the proposed project area (USFWS, 1993a and 2003). Surveys conducted in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
American peregrine falcon	*Falco peregrinus anatum*	SE, FSS, CDFS, DFGFP	Wetlands, coastal areas, bays	Potential habitat occurs in the proposed project area. Surveys conducted in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Project Area
Swainson's hawk	*Buteo swainsoni*	FSC, ST FSS,	Grasslands, scattered trees, juniper-sage flats, irrigated meadows; also use agricultural areas (particularly alfalfa fields) riparian areas and oak savannas for nest sites.	No active breeding pairs known in the area. Most of the breeding population is concentrated in the northern part of the Central Valley with separate and smaller breeding populations in Inyo and Modoc Counties (Bloom, 1980; Estep, 1989; Schlorff and Bloom, 1983).
Northern Goshawk	*Accipiter gentilis*	FSS, CSC	Coniferous, deciduous, and mixed forests. Depends on forests with a high density of large, old trees and high overstory canopy (e.g., birch, beech, juniper, pine, spruce, and fir).	Goshawk is included on the "Sensitive Species" lists of the U.S. Forest Service (USFS) We did not find data regarding breeding pairs in the proposed project area. Surveys conducted in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
California spotted owl	*Strix occidentalis occidentalis*	FSS, CSC	Coniferous, deciduous, and mixed hardwood forests. Depends on forests with a high density of large, old trees and high overstory canopy.	No active breeding pairs are known to occur in the project area. Great-horned owl (*Bubo virginianus*) was the only species detected by Jones and Stokes (2002).
Prairie falcon	*Falco mexicanus*	CSC	Generally found in open grassland, canyon, chaparral, and desert. Nests are placed on cliffs ledges. May forage in wetlands and coastal areas many miles from nest site.	Potential habitat occurs in the proposed project area. There are several CNDDB nest site records in the Liebre Mountain and Black Mountain quadrangles. Surveys conducted above Frenchman's Flat in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
Yellow warbler	*Dendrocia petechia brewsteri*	CSC, FWSMC	Riparian habitats	Known to occur along middle Piru Creek. Surveys conducted in 2002 and 2004 observed this species in riparian vegetation along middle Piru Creek (Jones and Stokes, 2002) (Aspen, 2004).
Tricolored blackbird	*Agelaius tricolor*	FSC, CSC	Emergent wetland, marsh, riparian habitat	No suitable nesting habitat occurs in the proposed project area, but the species may be found in the region. Surveys conducted in 2002 above Frenchman's Flat did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	SE, FWSMC	Floodplain riparian forests below 1,500 ft. Prefers nesting habitat consisting of cottonwood willow riparian forest.	Although potentially suitable habitat occurs in the proposed project area, the present known range does not include the proposed project area, and it has not been recently recorded in the region. Surveys conducted above Frenchman's Flat in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
Lawrence's goldfinch	*Carduelis lawrencei*	FWSMC	Dry grassy slopes with weed patches, chaparral, and open woodlands	Suitable habitat occurs in the proposed project area. Surveys conducted in 2002 consistently observed this species outside the riparian vegetation along middle Piru Creek (Jones and Stokes, 2002).
Mountain plover	*Charadrius montanus*	CSS	Prefers open habitats including alkaline flats, plowed ground, grazed pasture, dry short grass prairie, and open sagebrush areas. Preys on large insects such as grasshoppers, crickets, and flies.	Suitable habitat may occur in the proposed project area. Population declining and very local; occasionally fairly common. Winter resident from September through March. Surveys conducted along middle Piru Creek above Frenchman's Flat in spring and summer of 2002 and 2004 did not detect this species in the proposed project area (Jones and Stokes, 2002) (Aspen, 2004). Species is not known to nest in California. Nests in high-elevation grassland, often blue grama and buffalo grass patches (Graul, 1975)

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Project Area
Double-crested cormorant (rookery site)	*Phalacrorax auritis*	CSC	Aquatic species; common to rivers, lakes, estuaries, coastal areas	Potentially habitat occurs downstream but not in the proposed project area. Surveys conducted in 2002 and 2004 did not detect this species along middle Piru Creek (Jones and Stokes, 2002)(Aspen, 2004).
Great blue heron (rookery site)	*Ardea herodias*	CDFS	Aquatic, riverine, lakes, ponds. Roosts and nests colonially in large trees	Potential habitat occurs in the proposed project area. Surveys conducted in 2002 repeatedly observed this species along middle Piru Creek (Jones and Stokes, 2002). However, no rookery was found near the proposed project areas.
Great egret (rookery site)	*Ardea alba*	CDFS	Aquatic, riverine, lakes, ponds. Roosts and nests colonially in large trees	Potential habitat occurs in the proposed project area. Surveys conducted in 2002 observed this species along middle Piru Creek (Jones and Stokes, 2002). No rookery was found near the proposed project area.
White-faced ibis (rookery site)	*Plegadis chihi*	FSC, CSC	Nests in dense emergent wetland, forages in wet meadows, shallow lacustrine waters, irrigated pasture, and cropland	Suitable habitat does not occur within the proposed project areas. Surveys conducted above Frenchman's Flat in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
Loggerhead shrike	*Lanius ludovicianus*	FSC, CSC	Prefers open habitats with scattered shrubs, trees, fences and other perches	Potential habitat occurs within the general proposed project area. Surveys conducted above Frenchman's Flat in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
Purple martin (nesting colony)	*Progne subis*	CSC	Colonial species that requires tree cavities for nesting. Prefers riparian habitats in mountainous regions and lowlands.	Known to occur in the greater proposed project area such as Liebre Gulch, which is located several miles to the east of middle Piru creek (Jones and Stokes, 2002). Surveys conducted above Frenchman's Flat in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002) but suitable habitat exists in proposed project areas.
Bank swallow (nesting colony)	*Riparia riparia*	ST, CSC	Prefers sandy, vertical bluffs or riverbanks available for the birds to dig their burrows and nest in colonies	Known to occur in the general vicinity of the proposed project Surveys conducted above Frenchman's Flat in 2002 did not detect this species along middle Piru Creek (Jones and Stokes, 2002).
Mammals				
Townsend's big-eared bat	*Corynorhinus townsendii*	FSC, FSS, CSC	Occurs in a variety of habitats ranging from desert shrub to deciduous and coniferous forests at a wide range of elevations. Will use caves, mines, tree and rock cavities for roosting	The proposed project area has foraging habitat, and adjacent hillsides provide potentially suitable breeding and roosting habitat for this species. Bat surveys conducted above Frenchman's Flat by CDWR in August 2003 did not detect the presence of this species.
Pallid bat	*Antrozous pallidus*	CSC, FSS,	This species occurs in low elevation areas in scrubland, woodland, and grassland habitats. Roosting and maternal colonies are typically found in caves, rock crevices, mines, and buildings that provide cool daytime temperatures	The proposed project area has foraging habitat, and adjacent hillsides provide potentially suitable breeding and roosting habitat for Pallid bats. Bat surveys conducted above Frenchman's Flat by CDWR in August 2003 did not detect the presence of this species.

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Project Area
Western red bat	*Lasiurus blossevillii*	FSS	Primarily roosts in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores)	The proposed project area has foraging habitat, and adjacent hillsides provide potentially suitable breeding and roosting habitat for this species. Bat surveys conducted above Frenchman's Flat by CDWR in August 2003 did not detect the presence of this species.
Western mastiff bat	*Eumops perotis californicus*	CSC	Roosts in crevices in cliff faces. Known in closed canopy forests, scrub and chaparral communities.	Known from the Bluepoint Campground area (CNDDB 2003).
Yuma myotis	*Yuma myotis*	CSC	Roosts in crevices in cliff faces, bridges, and tunnels Known in closed canopy forests, scrub and chaparral communities.	Known to occur along middle Piru Creek below Pyramid Dam.
Tehachapi pocket mouse	*Perognathus alticolus inexpectatus*	FSS	Known from a few scattered localities from Tehachapi Pass to the area of Mt. Pinos, and around Elizabeth, Hughes, and Quail Lakes, between ca.3, 200 and -5,900 feet	Suitable habitat does not occur in the proposed project areas.
White-eared pocket mouse	*Perognathus alticolus alticolus*	FSS	Ponderosa and Jeffrey pine habitats. Uncommon in mixed chaparral and sagebrush habitats. It recently has been captured in a fallow field dominated by Russian thistle.	Known only from the western portion of the San Bernardino Mountains in the vicinity of Strawberry Peak, at altitudes extending from ca. 5,500 to 5,900 feet. No specimens have been collected since 1938 in the San Bernardino Mts.; this population may no longer exist. Suitable habitat may occur in the general proposed project area, but the species has not been recorded in the region.
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	CSC	Restricted to lower elevation grasslands and coastal sage scrub associations	Suitable habitat does not occur in the proposed project area. Found in the Los Angeles Basin, from Burbank and San Fernando on the northwest to San Bernardino on the northeast, and Cabazon, Hemet, and Aguanga on the east and southeast. Geographic limits on the southwest are not known. No observations of this species have occurred in the project area, and the proposed project is located outside the Los Angeles basin.
San Joaquin pocket mouse	*Perognathus inornatus inornatus*	FSC	Shrubby ridge tops and hillsides, open, sandy areas with grasses and forbs, blue oak savannah	CNDDB record (1989) for Hungry Valley State Vehicular Recreation Area in the Black Mountain quadrangle. This species is not known to occur in the proposed project area.
Mt. Pinos lodgepole chipmunk	*Tamias speciosus calllipeplus*	FSS	Occurs on Mt. Pinos	Suitable habitat for this species does not occur in the proposed project area. CNDDB records indicate this species has been sighted at Mt. Pinos.

Sources: CDFG 2003; CDWR IS/MND for Piru Creek Erosion Repairs and Seismic Retrofit Project 2003.

FT = Federally Threatened Species
FE = Federally Endangered Species
FSC = Federal Species of Special Concern
FSS = USFS Sensitive Species
PT= Federally Proposed Threatened Species
FWSMC = USFWS-protected migratory species
BLMS = BLM Sensitive Species
SE = State Endangered Species
ST= State Threatened species
CSC = California Species of Special of Special Concern
DFGFP = CDFG Fully Protected Species
CDFS = California Dept. of Forestry Service

Fish

Sensitive Species

Arroyo chub. The State species of special concern arroyo chub (*Gila orcutti*) is a small native fish that typically occurs in slow moving portions of warm streams with highly variable stream flows. Arroyo chub breed in streams and lakes but prefer to spawn in small pools between February and August where eggs are broadcast over beds of aquatic vegetation.

Historically the species was native to Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita Rivers, and Malibu and San Juan Creeks. Along middle Piru Creek this species was once identified in 1965 prior to construction of Pyramid Dam. Surveys completed in the 1980s did not detect the presence of this species (Deinstadt et al., 1990), and it is not expected to occur in middle Piru Creek (United, 2002). However, this species has been successfully introduced far outside its native range, often with trout plants, including the Ventura River. This species is now naturally abundant only in the west fork of the San Gabriel River (USFWS, 2003).

Amphibians

Federally Listed Species

Arroyo Toad. The federally endangered southwestern arroyo toad is a small toad that measures approximately 2 to 3 inches (5 to 8 centimeters) in length (Campbell et al., 1996). It is a light greenish-gray or tan toad with warty skin and dark spots. Its underside is buff colored and it has a light colored stripe that crosses its head and eyelids.

The arroyo toad is considered an extreme habitat specialist, restricted to shallow pools and open sand and gravel channels along low-gradient reaches of third- or fourth-order streams. These streams can be either intermittent or perennial and generally undergo flooding that scours vegetation and replenishes fine sediments. For breeding, adult arroyo toads use open sites such as overflow pools, old flood channels, and pools with shallow margins on streams (Sweet, 1992). Shallow pools less than 12 inches (30 centimeters) deep with clear water, flow rates less than 0.2 feet (5 centimeters) per second, and bottoms composed of sand or well-sorted fine gravel are preferred by adults for breeding (Sweet, 1992 and 1993).

Factors influencing survival between breeding seasons may include desiccation, starvation, predation by native and introduced species, and activities that disturb non-breeding habitats (Sweet, 1992). Drought, especially when combined with water diversions from streams, can lead to a scarcity or early drying of breeding pools and restrict foraging during the period essential for rapid growth. Drought and water diversions also cause the loss of damp subsurface soil, which may result in high adult mortality (Sweet, 1992). The extended 5-year drought in southern California during the late 1980s has been closely tied to extremely low reproductive success and subsequent population declines of arroyo toads during this period (Sweet, 1992). Predation can be another factor in the reduction of the size and distribution of the arroyo toad population (Hayes and Jennings, 1986). Predatory fish, such as largemouth bass, green sunfish, and arroyo chub prey on tadpoles and juvenile toads. The introduced bullfrog can also prey on adult arroyo toads (Sweet, 1992).

Breeding occurs from March to July in shallow pools of slow moving streams in semi-arid regions. Male arroyo toads typically arrive at the breeding pools 1 to 3 weeks prior to the females, sometimes by the second week of February if weather conditions are favorable (i.e. in coastal parts of San Diego County). The courtship vocalization is a high trill; courtship usually lasts 8 to 10 days. Males may

continue to call until June although the peak of activity usually occurs between March and May. During this time arroyo toads are highly susceptible to predation by bullfrogs, which are attracted to calling arroyo toads.

Breeding may continue into early July depending on when individual females reach appropriate reproductive conditions and when the males stop calling (Sweet, 1992). The eggs are laid on sand, gravel, cobble, or mud, generally located away from vegetation in the shallow margins of the pool (Sweet, 1992). Sub-adult and adult toads may range widely into the surrounding uplands; ranging is common up to 0.3 mile (0.5 kilometers) and can be as much as 1.2 miles (2.0 kilometers) from a stream.

Areas used by juveniles consist primarily of sand or fine gravel bars with adjacent sandy terraces and streamside flats (USFWS, 1999a). Juveniles favor sites that remain damp and contain less than 10 percent cover because these areas possess the thermal and refuge characteristics required for survival and optimal growth (Sweet, 1992). Adults use terraces that extend 328 feet (100 meters) or more from the stream during the non-breeding season, where they excavate shallow burrows for use during the day or longer intervals in the dry season (Campbell et al., 1996).

Arroyo toads are known to occur along middle Piru Creek between Bluepoint Campground and the gorge area downstream of Frenchman's Flat (creek mile 4 to creek mile 18). Currently, no arroyo toads occur in the area between Pyramid Dam and Frenchman's Flat (creek mile 0 to creek mile 4). Surveys conducted for the CDWR in 1998 and 1999 in this section of middle Piru Creek did not detect the presence of arroyo toads. Similarly, habitat conditions for this species were not favorable and would not be expected to support populations of arroyo toad (Hovore et al. 1999).

Arroyo toad males were heard between creek mile 13 and creek mile 16 during the spring of 2004. Similarly, twelve egg clutches were identified during biological surveys conducted in April and May of 2004 by United biologists above Bluepoint Campground (creek mile 16) (Sandburg, 2004). Although arroyo toads are known to occur in the proposed project area, modification of natural flows, summer flow augmentation, and attenuation of storm events have led to a decline in the population of this species. Unnatural summer flows have led to the encroachment of vegetation on the sandy bars and terraces required for reproduction, increased exotic predator populations, and increased water velocities of the creek, which can wash arroyo toad tadpoles and juvenile toads downstream. Water released from the dam during May 2003, in excess of 100 cfs, may have either swept arroyo toad egg masses and tadpoles downstream or inundated suitable breeding sites. These flows may have prevented successful reproduction of arroyo toad along middle Piru Creek during the 2003 season (USFWS, 2003).

California red-legged frog. The California red-legged frog (*Rana aurora draytonii*) is federally threatened and a State species of special concern. It is a medium-sized frog that historically occurred in coastal mountains from Marin County south to northern Baja California, as well as along the floor and foothills of the Central Valley from Shasta County south to Kern County (Jennings and Hayes, 1994). Currently, this species generally occurs in the coastal portions of its historic range; the species is extremely rare in most of southern California south of Ventura County.

California red-legged frogs are usually confined to aquatic habitats such as creeks, streams and ponds; they occur primarily in areas having pools approximately three feet deep, with adjacent dense emergent or riparian vegetation (Jennings and Hayes, 1994). Adult frogs move seasonally between their egg-laying sites and foraging habitat, but they rarely move far from their aquatic habitat. Major predators include wading birds, introduced predatory fish, bullfrogs, and native garter snakes, all of which inhabit middle Piru Creek.

Nearby vegetation structure is important for escape cover from predators and possibly as shading to maintain cool water temperature (Hayes and Jennings, 1988). Preferred vegetation often includes, but is not limited to, cattails, bulrushes (*Scirpus* spp.), and willows. At sites with adult California red-legged frogs, vegetation typically shades a substantial portion of the existing water surface area and is dense at or near water level (Hayes and Jennings, 1988).

Reproduction of the California red-legged frog occurs between late November and early April (Jennings and Hayes, 1989). This timing probably ensures that water is cool enough for embryonic survival and that there is sufficient water for larval growth to metamorphosis. Male California red-legged frogs appear at breeding sites two to four weeks before females (Storer, 1925; Jennings et al., 1993). Females typically attach egg masses to stems of emergent vegetation such as bulrushes or cattails; the egg masses contain from 2,000 to 5,000 dark brown eggs (Wright and Wright, 1949; Hayes and Miyamoto, 1984; Jennings et al., 1993). Hatching time is 6 to 14 days, and tadpoles metamorph between July and September, approximately 3.5 to 7 months after egg laying (Jennings et al., 1993). Males probably reach reproductive maturity after 3 years; females reach reproductive maturity after four years of age (Jennings and Hayes, 1985).

Current threats to California red-legged frogs include dam construction, livestock grazing, and non-native predators (Fisher and Schaffer, 1996; USFWS, 1993; Wake, 1991). The introduction of non-native fish and bullfrogs is probably responsible for the absence of red-legged frog from perennial stream habitats over most of its former range (Jennings et al., 1993; Moyle, 1973). Many of the more than 50 exotic and transplanted wildlife species introduced into California waters are known to prey on frogs or their tadpoles or eggs.

Potential habitat for California red-legged frogs occurs at select locations of middle Piru Creek where suitable deep-water pools and emergent vegetation have developed. This species is known to have occurred historically on sections of the creek and has been documented at Agua Blanca Creek, a tributary of middle Piru Creek. However, it is unlikely that this species currently exists along middle Piru Creek. The rarity of the species regionally is attributed to loss of habitat and the high densities of exotic predators.

Reptiles

Sensitive Species

Southwestern pond turtle. The southwestern pond turtle (Cl*emmys marmorata*) is a federal and State species of special concern; it is the only abundant native turtle in California (Zeiner et al., 1988). Historically it occurred in most Pacific slope drainages from Oregon to the Mexican border. Its current range is similar to its historic range; but populations have become fragmented and reduced by agriculture, urban development, and habitat alteration. Population numbers have also decreased due to competition with, and predation from, exotic and introduced species such as bullfrogs, largemouth bass, and sunfish (Holland, 1986; Jennings and Hayes, 1994).

Pond turtles live in rivers, streams, lakes, ponds, vernal pools, seasonal wetlands, and intermittent streams with permanent pools. Although they prefer freshwater, they also seem to tolerate slightly brackish conditions. Adult turtles require slow-moving water and appropriate aerial and aquatic basking sites such as logs, tree trunks, banks, and ledges. Hatchlings (individuals less than one years old) require shallow water with adjacent, dense vegetation for refuge (Jennings and Hayes, 1994). In addition, the southwestern pond turtle needs terrestrial habitat for egg-laying, over-wintering, and

overland dispersal. In areas with mild climates, turtles are active all year in both aquatic and terrestrial habitats (Holland, 1986).

Potentially suitable habitat for southwestern pond turtle occurs throughout most of the proposed project area, and this species has been observed at several locations along middle Piru Creek and its tributaries.

Two-striped garter snake. The two-striped garter snake (*Thamnophis hammondii*) is an aquatic snake and a State species of special concern that is known to occur from Monterey County south to Baja California, Mexico (CDFG, 1990; Jennings and Hayes, 1994). Two-striped garter snakes typically occur in perennial and intermittent streams with rocky beds bordered by willow thickets or other dense vegetation. This species may also inhabit shallow rivers, stock ponds, or large vernal pools bordered by riparian vegetation. Similarly, Rathburn et al. (1993) found that these snakes tend to occupy streamside sites during the summer and switch to nearby upland habitats during the winter. Although somewhat more aquatic, the range, habitats, and food habits of this species overlap considerably with those of the common garter snake (*T. sirtalis*) and the western terrestrial garter snake (*T. elegans*) (Rossman et al., 1996; Stebbins, 1985).

Primarily active during evening and night, the two-striped garter snake's diet commonly consists of amphibians and their larvae, fish, earthworms, and leeches. Record longevity is close to eight years (Fitch, 1941). This species is a live-bearer that typically produces about 10 to 25 young approximately 7 to 10 inches long in late summer (CDFG, 1990; Cunningham, 1959). Two-striped garter snakes may be taken as prey by mammals, birds, and other snakes (CDFG, 1990; Jennings and Hayes, 1994). Juveniles are especially susceptible to predation by bullfrogs and largemouth bass.

The two-striped garter snake is now common only in eastern San Diego County (Jennings and Hayes, 1994). Populations have been affected by the elimination of riparian habitat through agricultural and urban development and predation by introduced bullfrogs and fish (Jennings and Hayes, 1994).

Suitable habitat for two-striped garter snake occurs throughout the proposed project area and this species is known to occur in the proposed project area. This species was recently observed during reconnaissance surveys conducted by CDWR biologists at Frenchman's Flat and near Bluepoint Campground (Aspen, 2004).

Birds

Federally Listed Species

Southwestern willow flycatcher. The federally and State-listed endangered southwestern willow flycatcher (*Empidonax traillii extimus*) is a migratory passerine species that breeds in California from late spring through late summer; it migrates to wintering grounds in Central America and portions of South America during the non-breeding season (Zeiner et al., 1990a). The southwestern willow flycatcher's breeding range includes southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Nevada and Utah, and northwestern Mexico. In southern California, this subspecies is now a very rare and local summer resident on the San Luis Rey and Santa Margarita Rivers.

The southwestern willow flycatcher is a riparian obligate species that breeds along rivers, streams, wetlands, and other aquatic-associated habitats such as extensive riparian woodlands with water-filled creeks and channels and scattered overgrown clearings.

The proposed project area supports potential breeding habitat for this species in a variety of riparian habitat types (e.g., willow and mulefat scrub and riparian woodland vegetation). No southwestern willow flycatchers are reported in the CNDDB; however, non-breeding flycatchers were observed in middle Piru Creek in 2003 and 2004 and one possible nesting pair was identified near Bluepoint Campground by USFS biologists in 2002. (Aspen, 2004).

Least Bell's vireo. The federally and State endangered least Bell's vireo (*Vireo bellii pusillus*) is a small and secretive migratory bird that is closely associated with dense stands of riparian vegetation along streams and rivers. Least Bell's vireos typically arrive at their breeding grounds in southern California riparian areas by mid-March and depart for their wintering grounds in late August (Zeiner et al., 1990a).

For breeding, least Bell's vireos prefer riparian woodlands that combine a dense understory with a tall canopy. Their small cup-shaped nests are made from plant material and are typically placed on slender branches approximately two or three feet above the ground.

The proposed project area does not contain critical habitat for least Bell's vireo, although riparian areas in nearby streams (i.e., the Santa Ynez and Santa Clara Rivers) have been designated critical habitat for this species. Although the extensive riparian habitat now present in the proposed project area could be considered potential least Bell's vireo breeding habitat, no least Bell's vireo are expected to occur in the proposed project area because middle Piru Creek has not historically supported populations of this species. In addition, protocol level surveys conducted above Frenchman's Flat by CDWR biologists have not located least Bell's vireo in middle Piru Creek (Aspen, 2004). One pair of vireos may have been sighted near Bluepoint Campground by USFS biologists in 2002, however the species has not been recorded nesting in the area since that time.

California condor. The federally and State endangered California condor (*Gymnogyps californianus*) is a large vulture-like scavenger that is a permanent resident of semi-arid, rugged mountain ranges surrounding the southern San Joaquin Valley, including the Coast Ranges from Santa Clara County south to Los Angeles County, the Transverse Ranges, Tehachapi Mountains, and southern Sierra Nevada (Zeiner et al., 1990a).

The California condor forages for carrion over wide-open areas (e.g., open savannah, grasslands, foothill chaparral, and rangeland) and nests in caves, crevices, spaces behind rock slabs, or on large ledges on high sandstone cliffs (Zeiner et al., 1990a). Condors are known to occur in Los Padres National Forest and this species may occasionally forage along middle Piru Creek

State-Listed Species

Western yellow-billed cuckoo. The State endangered western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is an uncommon to rare summer resident in California. In California, this species is generally found foraging and breeding in desert foothill and valley riparian habitats that support extensive riparian woodlands, especially those dominated by cottonwood and willow.

The extensive riparian vegetation in the proposed project area provides potential foraging and nesting habitat for yellow-billed cuckoos. This species, however, has not been reported in the proposed project area.

Sensitive Species

Great egret. The great egret (*Ardea alba*) is a California Department of Forestry (CDF) sensitive species. The great egret is a large wading bird that is a year round resident of California; it is commonly seen in wetlands, estuaries, ponds, lakes, agricultural lands, rivers, and other aquatic environments. This species commonly occurs along coastal California and throughout the Central Valley.

Great egrets are colonial breeders that use the sticks and stems of marsh plants to build large nests in secluded trees near water (Zeiner et al., 1990a). Like great blue herons, the great egret is a predatory bird that wades slowly into shallow water waiting patiently for opportunities to strike and capture prey such as fish, crustaceans, and small amphibians and reptiles.

The entire wetted channel of middle Piru Creek and the shorelines of the Lake Piru provide foraging habitat for great egrets. Additionally, the riparian habitat and adjacent upland trees in the vicinity of the proposed project area provide potentially suitable rookery habitat for this species. No nesting great egrets have been reported in the proposed project area, but several individuals have been observed during biological reconnaissance surveys of middle Piru Creek (Jones and Stokes, 2002; Aspen, 2004).

Great blue heron. The great blue heron (*Ardea herodias*) is a CDF sensitive species. These large wading birds are commonly seen in wetlands, estuaries, ponds, lakes, agricultural lands, rivers, and other aquatic environments throughout most of California. This species generally occurs along the coastal slope of central and southern California, and the foothills of the Central Valley (Zeiner et al., 1990a).

Great blue herons typically breed in colonies at the top of secluded large snags or live trees near shallow water foraging areas (Zeiner et al., 1990a). They typically wade slowly into shallow water waiting for opportunities to strike and capture prey such as fish, crustaceans, and small amphibians and reptiles.

The entire wetted channel of middle Piru Creek and the shorelines of the Lake Piru provide foraging habitat for great blue herons. Additionally, the large riparian and adjacent upland trees in the vicinity of the proposed project area provide potentially suitable rookery habitat for this species. No nesting great blue herons have been reported in the proposed project area, but several individuals have been observed foraging along middle Piru Creek during recent surveys (Jones and Stokes, 2002; Aspen, 2004).

Yellow warbler. The State species of special concern yellow warbler (*Dendrocia petechia brewsteri*) is a rare but regular resident in southern California riparian communities (Zeiner et al., 1990a). This species usually arrives in California in April and departs by October. Small numbers of this species are also known to regularly winter in the lowlands of southern California (Garrett and Dunn, 1981).

Breeding occurs from mid-April to early August, typically in mature riparian woodland dominated by willows or alders. This species has also been identified nesting in chaparral and mixed conifer habitats; nests are usually placed in heavy brush understory in a deciduous sapling or shrub (Garrett and Dunn, 1981; Zeiner et al., 1990a). The proposed project area supports suitable foraging and nesting habitat for the yellow warbler, and this species has been observed during past and recent wildlife surveys nesting in riparian habitat along middle Piru Creek near creek mile 2 (Jones and Stokes, 2002; Aspen, 2004).

3.1.3 Applicable Regulations and Significance Criteria

3.1.3.1 Applicable Regulations

Federal Endangered Species Act (FESA) of 1973. Title 16, United States Code, Section 1531 et seq., and Title 50, Code of Federal Regulations (CFR), Part 17.1 et seq.

FESA and Title 50, CFR, Part 17.1 et seq. designate and provide for the protection of threatened and endangered plant and animal species and their critical habitat. The administering agency is the USFWS. Implementation of the proposed project would prevent incidental take of the federally endangered arroyo toad as a result of State Water Project water operations. Based on CDWR coordination with the USFWS to date, no formal consultation regarding FESA is anticipated.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act makes it unlawful to pursue, hunt, capture, kill, possess, or attempt such an action towards any bird listed in wildlife protection treaties between the United States and several countries including Great Britain, Mexico, Japan, and countries that are part of the former Union of Soviet States. A "migratory bird" includes the living bird, any parts of the bird, and its nests or eggs. Disturbance of the nest of a migratory bird requires a permit issued by the USFWS pursuant to Title 50 CFR. Almost all birds, except for some nonnative pests, are protected by the Act. The administering agency for the Act is the USFWS.

Clean Water Act of 1977 (33 U.S.C. 1251 et seq.)

The Clean Water Act (CWA, also known as the Federal Water Pollution Control Act) is the principal federal law governing the protection of wetlands and water pollution control. This Act provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters. No physical alteration to the stream channel or alteration of water quality is expected to occur from the proposed project and no permits are anticipated to be required to restore natural flows to middle Piru Creek. The RWQCB and the U.S. Army Corps of Engineers are the administrative agencies for the CWA.

California Endangered Species Act of 1984 (Fish and Game Code Section 2050 et seq.)

This Act provides for the protection of rare, threatened, and endangered plants and animals, as recognized by the CDFG, and prohibits the unauthorized taking of such species. State agencies are required to consult with the CDFG on actions that may affect listed or candidate species. The California Endangered Species Act greatly expanded upon the protection afforded to rare, threatened, and endangered plants under the earlier California Native Plant Protection Act of 1977. If a proposed project results in the take of a State listed endangered, threatened, or candidate species incidental to an otherwise lawful action, the CDFG may authorize such take through a permit ("2081 permit") provided certain conditions are met. The proposed project would not result in the take of any California threatened, endangered, or sensitive species.

Fully Protected Species

California Fish and Game Code Sections 3511, 4700, 5050, and 5515 prohibit the take of animals that are classified as fully protected in the State. Implementation of the proposed project would not result in the take of any fully protected species.

Nest or Eggs – Take, Possess, or Destroy

California Fish and Game Code Section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. The proposed project would not result in the needless destruction of any nest or eggs. Nests or eggs could be lost as a result of natural stream processes such as scour or inundation of riparian vegetation.

Birds of Prey – Take, Possess, or Destroy

California Fish and Game Code Section 3503.5 specifically protects California's birds of prey in the orders Falconiformes and Strigiformes by making it unlawful to take, possess, or destroy any such birds of prey or to take, possess, or destroy the nest or eggs of any such bird. The proposed project would not result in impacts to birds of prey or their nests.

Migratory Birds – Take or Possession

California Fish and Game Code Section 3513 protects California's migratory non-game birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act (above) or any part of such migratory non-game bird. Implementation of the proposed project would not result in the take of migratory birds.

Streambed Alteration Agreement

Pursuant to Sections 1600 et seq. of the California Fish and Game Code, the CDFG regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake. Section 1602 states that an entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream or lake without submitting a formal notification to the CDFG.

The proposed project does not constitute an obstruction or diversion of "natural flow," since the CDWR would operate Pyramid Dam so that outflow would equal middle Piru Creek inflow. Whether or not the proposed project would substantially change the bed, channel, or bank of the creek, however, is less clear. The USFWS has informed CDWR that the proposed simulation of winter natural flow might result in the scouring of middle Piru Creek by high volumes of water during winter storms, resulting in the reduction of vegetation encroachment, redistribution of sediments, and the creation of sandbars (USFWS, 2003). They conclude that the scouring action of heavy flow may be beneficial to the endangered arroyo toad, precisely because of changes it brings to the banks and bed of the creek. Riparian ecosystems are dynamic by nature. The scouring effects of winter storm flows are an integral part of local stream ecology and play a vital role in the maintenance of habitat for wildlife along the watercourse. The only "change" contemplated by CDWR in proposing the project is the restoration of those natural processes to the extent possible. It does not appear that restoring natural fluctuations in the vegetation line and sediment distribution essential to the formation of wildlife habitat was the sort of change contemplated by the Legislature when it drafted Section 1602 of the California Fish and Game Code. Through the project's CEQA process, the CDFG has been notified of the proposed project and provided with the opportunity to comment on whether a Section 1602 agreement will be necessary.

Porter-Cologne Water Quality Control Act

Regional water quality control boards regulate the "discharge of waste" to "waters of the State." All projects proposing to discharge waste that could affect waters of the State must file a waste discharge report with the appropriate regional board. The board responds to the report by issuing waste discharge

requirements (WDR) or by waiving WDRs for that project discharge. Both of the terms "discharge of waste" and "waters of the State" are broadly defined such that discharges of waste include fill, any material resulting from human activity, or any other "discharge." Isolated wetlands within California, which are no longer considered "waters of the United States" as defined by Section 404 of the CWA, are addressed under the Porter-Cologne Act. Implementation of the proposed project would not result in the importation of fill into "waters of the State."

3.1.3.2 Significance Criteria

The primary purpose of the proposed project is to modify stream releases from Pyramid Dam to avoid the incidental "take" of arroyo toad in middle Piru Creek. Simulating the natural flow regime would also provide for the establishment of natural fluvial processes below Pyramid Dam and restore the natural dynamic cycle of disturbance in the creek that is required for the protection and preservation of habitat for other sensitive riparian species. This impact analysis focuses on the biological effects of simulating the natural flow regime in middle Piru Creek and the associated wildlife reliant on riparian communities and natural stream processes. The analysis also addresses the possible beneficial effects that would occur to arroyo toad and other aquatic species.

The goals of this impact evaluation are to disclose significant impacts associated with the proposed project and develop mitigation options for significant adverse impacts where possible. For the purposes of this analysis, a significant adverse impact would occur if the proposed project would result in a:

- Substantial loss of individuals of a federal- or State-listed endangered or threatened species such that breeding success or sustainability of the population would be adversely affected
- Substantial loss of populations or habitat of a Federal Species of Concern (FSOC) or California Species of Special Concern (CSSC) that would jeopardize the continued existence of the species within the region
- Substantial loss of habitat for sensitive species
- Loss or long-term disruption of a major wildlife movement corridor
- Substantial loss of natural vegetation, especially vegetation that is slow to recover
- Substantial loss of species or community diversity in natural vegetation and wildlife habitat, including loss or substantial degradation of wetlands
- Loss of critical habitat designated by the USFWS or sensitive plant communities designated by the CDFG.

3.1.4 Environmental Impacts and Mitigation Measures

An impact is considered to be substantial if it is potentially of large magnitude and/or long duration, taking into account the abundance, distribution, and sensitivity to impact of the affected resource. The evaluation of impacts to biological resources is driven by potential direct and indirect impacts as well as the potential ecological benefits that may occur to habitats and species from implementation of the proposed project. These include a number of federally or State listed threatened or endangered species and federally or State listed species of special concern (see Tables 3.1-1 and 3.1-2 for a summary of special status species and potential for occurrence in the proposed project area). For the purpose of this analysis the following definitions of direct, indirect, permanent, and temporary impacts have been used.

- **Direct Impacts** are defined as those impacts that result from the implementation of the project and would occur at the same time or place.
- **Indirect Impacts** are caused from implementation of the project but occur at a later time or are farther removed but may still occur in the foreseeable future.

- **Permanent Impacts** result in the irreversible loss of biological resources including habitat, sensitive species, breeding areas, or wildlife corridors.
- **Temporary Impacts** result in short term losses to vegetation, nesting and breeding habitat, or disruption of wildlife corridors. Temporary impacts may occur from scour or changing water surface elevations.

Impact B-1: Loss of or Damage to Non-sensitive Plants and Wildlife

The proposed project would not result in adverse impacts to terrestrial wildlife occurring along middle Piru Creek. Even during exceptionally dry summers, when the creek might temporarily stop flowing for some time, deep pools would remain that would provide water for terrestrial animals, and riparian vegetation would continue to provide habitat for foraging, resting, and breeding. The current hydrologic regime has probably resulted in the expansion of riparian vegetation along middle Piru Creek. The creek's thick vegetation, while providing some benefits to terrestrial wildlife, has modified the channel morphology by promoting channel incision, which may affect organisms that require calm water and slow current velocities. Similarly, maintenance of the current hydrologic regime would continue to provide conditions favorable for exotic predators including bullfrogs, crayfish, and largemouth bass. While some native terrestrial animals prey on many of these exotic species, the reduction of aquatic predators would greatly enhance conditions for native aquatic species.

Rainbow Trout. Rainbow trout in the proposed project area would be subject to direct impacts by implementation of the proposed project. Direct impacts from reduced summer flows would include a reduction in aquatic habitat, increased heat stress, and increased predation by aquatic and terrestrial predators. Under the current flow regime, 25 cfs of water are released from Pyramid Dam from April 1st through August 31st to maintain a year-round trout fishery between Pyramid Dam Bridge and Frenchman's Flat. Under the proposed project, water released into middle Piru Creek would match inflow into Pyramid Lake. Historic USGS stream gauge data indicate that during dry years, inflows into Pyramid Lake are minimal and would provide less than 10 cfs of water for middle Piru Creek. Although not a common occurrence, historic data indicate that Pyramid Lake has periodically received no stream in-flow. Recurrence of such dry summers would result in sections of middle Piru Creek temporarily running dry, with water limited to deep pools and channels. In fact, USGS stream data indicate that prior to construction of Pyramid Dam, little if any stream flow was recorded between July and October in the lower reaches of middle Piru Creek above Lake Piru (Section 3.2.2.1, Figure 3.2-4).

Despite additional water releases that occur during the summer, rainbow trout are not stocked from June through October as water temperatures approach the thermal limits for the fish. Rainbow trout prefer cold water habitats with water temperatures generally less than 59°F (15°C). Upper lethal limits may occur at temperatures between 73°F to 77°F (23°C to 25°C) although many salmonids can survive short-term temperatures as high as 80°F to 82°F (27°C to 28°C) (Lee and Rinne, 1980). Increased summer flows now occurring in middle Piru Creek are provided in an effort to maintain fish populations through the heat of the summer, but even under existing conditions trout likely experience thermal stress and reduced fitness (CDFG, 2004b).

The proposed project would be likely to result in periods of reduced flows, as compared to current conditions, during the late summer and fall. This would result in increased water temperatures and further thermal stress on rainbow trout and would probably restrict fish to isolated pools and deep channels. While some fish would probably survive in deep pools and shaded canyons, implementation of the proposed project would result in an adverse impact to rainbow trout and would potentially eliminate the majority of trout occurring in middle Piru Creek between July and October. In addition, decreasing water levels would also increase the risk of predation from birds such as herons and egrets.

The existing put and take trout fishery at Frenchman's Flat is only stocked between November and May of each year to avoid thermal stress to the trout. Due to this stocking regime, summer usage of the creek shifts from angling to swimming and camping. Under the proposed project, trout populations in the Frenchman's Flat area that may be lost through desiccation or thermal stress would be replaced by annual winter and spring stocking. Populations of naturally breeding trout occurring in the catch and release area would also be adversely affected by the restoration of natural flows. Although adverse, this impact would not be considered significant because the rainbow trout occurring in the catch and release area are descendents of hatchery raised fish rather than native rainbow trout (CDFG, 2004a). While middle Piru Creek once supported populations of native rainbow trout or steelhead, the steelhead fishery was disrupted long before the construction of Pyramid Dam (i.e., by construction of Santa Felicia Dam in 1954). In addition, even if any steelhead had been trapped upstream by construction of the Santa Felicia Dam, the genetic integrity of the population would have been highly diluted long ago by interbreeding with hatchery raised fish stocked in middle Piru Creek, Lake Piru, and escapees from Pyramid Lake. Therefore, steelhead are not expected to occur in the proposed project area. Although the existing population of rainbow trout may be substantially reduced as a result of the proposed project, there may be enough summer flow to maintain a small population of wild trout upstream of the concrete weir. In addition, CDFG may determine that stocking of this area is possible, provided access to the creek is available. From a biological perspective, the removal of a non-native fishery from middle Piru Creek would not be considered a significant impact and no mitigation measures are proposed. There may be some impacts to recreation opportunities, however. For a complete discussion of potential impacts to recreational fishing along middle Piru Creek, please see Section 3.4.4.

Under the proposed project, periodic testing of the radial gates on Pyramid Dam would also occur. The maximum amount of water that would be released from the dam during any testing event would consist of 50 cfs for 15 minutes. However, it is expected that testing would generally consist of smaller releases (typically releases of 5 to 20 cfs for five minutes or less). In addition, test releases typically only occur two or three times a year and would be avoided between March 15th and July 31st, although emergency circumstances could arise where such releases are unavoidable during this period.

Section 3.2.4 provides a detailed discussion of the hydrological effects of testing activities. Periodic test releases are not expected to result in adverse impacts to rainbow trout. Test releases would consist of short-term events that would be similar to a very small natural rain event and would not result in substantial changes to water surface elevations along middle Piru Creek. In addition, it is unlikely that water from test releases would be measurable several miles downstream of Pyramid Dam as the flows are attenuated by ground water recharge, evapotranspiration, and evaporation. Similarly, natural flows of 50 cfs or more are common during the rainy season, so it is unlikely that test releases would cause an adverse impact during those months. In addition, periodic monsoons, which are common in the transverse mountain ranges, could result in natural discharges of 50 cfs or more during summer months.

Scheduled water deliveries to United would also occur between November 1st and February 28th each year. Although additional water would be transported downstream during this period, scheduled releases would be similar to natural storm events and would not result in substantial changes to the creek's hydrology. Alternatively, United's water deliveries could be spread out over several months during the winter season. This scenario would add approximately 13 cfs to the creek's natural flow during this period. As both the test releases and United's water deliveries would be within the range of natural stream flows and would not constitute abnormal flows, no impacts to populations of rainbow trout or other aquatic resources would occur.

Impact B-2: Loss of or Damage to Sensitive Plants

No federally or State endangered plants would be directly affected by the proposed project. Of the 29 sensitive plant species that have the potential to occur in the proposed project area (Table 3.1-1) only Gambell's watercress (*Rorippa gambellii*), a federally endangered and USFS sensitive plant, has a potential to occur in areas that would be subject to impacts from possible changes in creek flow.

Gambell's watercress is a perennial herb that grows along stream banks and lake margins. It flowers from May to August and was once distributed in a number of locations in coastal central and southern California from San Diego County to the Nipomo Mesa. It is also known to occur historically in northern Baja California, Mexico. However, this species has not been seen for many years in any area other than southern San Luis Obispo County. In addition, no CNDDB records for this species exist in the proposed project area, and this species was not identified during either focused botanical surveys above Frenchman's Flat or reconnaissance surveys conducted above Bluepoint Campground.

There is no indication that any other sensitive or rare plants occur along middle Piru Creek. Extensive botanical surveys conducted by CDWR (CDWR, 2002 and 2004) between Frenchman's Flat and the Pyramid Dam did not identify any federal or State listed plant species in the riparian corridor. However, rainfall from July 2001 through June 2002 was well below normal across most of southern California, including most of Los Angeles and Ventura Counties (NOAA, 2002; CDWR, 2003a). In fact, during the 2001-2002 water year only 3.5 inches of rain were recorded at Pyramid Dam. It is possible that sensitive annual species may have failed to germinate or flower due to these dry conditions. Furthermore, some bulb-forming species such as mariposa lily may have failed to flower and may not have been observed during the previous surveys. However, CDWR conducted multiple botanical surveys at several locations along middle Piru Creek in the spring and summer of 2002 and 2004 and did observe various non-sensitive flowering annual plants despite below average rainfall. However, if sensitive plant species are present, it is unlikely that simulating natural flows on middle Piru Creek would negatively affect areas supporting these species.

Adjacent habitats also have the potential to support sensitive species, particularly upland slopes of sage scrub and chaparral. However, these areas would be unlikely to be subject to project-related disturbance and are located outside of the predicted scour zone of the creek. Natural stream processes do have the potential to result in erosion of the stream bank that could lead to landslides or subsidence of adjacent habitat containing upland species. However, this is essentially a natural stream process. Furthermore, while disturbance is detrimental to some plants, other are adapted to it or even require periodic disturbance. Therefore, the direct and indirect impacts resulting from restoration of natural stream processes would be considered less than significant. Although focused botanical studies have not been conducted for the entire length of middle Piru Creek, the proposed project would likely result in overall beneficial effects on sensitive plants by restoring the natural stream dynamics required for many of these species to survive. Overall direct and indirect impacts to sensitive plants are not expected to be significant, and no mitigation is proposed.

Impact B-3: Loss of or Damage to Sensitive Natural Communities

Returning middle Piru Creek to a natural flow regime has the potential to affect riparian habitats by increasing the period and intensity of flooding events (i.e., scour, inundation, and sediment transport), altering the existing hydrologic regime by eliminating artificial summer flow augmentation, and reducing non-natural successional pathways by re-establishing the stochastic cycle of natural disturbance. No riparian vegetation would be physically removed manually or mechanically, as the proposed project would be limited to modifying flow releases from Pyramid Dam to match the inflow

of water into Pyramid Lake. Changes to riparian vegetation could occur from implementation of the proposed project through increased scour and elimination of augmented summer flows. However, these are natural processes; hence their direct and indirect effects would be considered less than significant. The potential impacts to riparian habitat that may occur as a result of the proposed project are a function of restoring natural stream processes rather than an initiation or continuation of anthropogenic factors. Therefore, potential impacts would be considered beneficial to the riparian habitat in middle Piru Creek resulting from the restoration of a simulated natural flow regime. For a complete discussion of potential effects to riparian vegetation from implementation of the proposed project see the Planning Level Riparian Delineation Report (CDWR, 2004). In addition, no direct or indirect impacts to riparian communities would be expected to occur from test releases or delivery of water to United. As both the test releases and water deliveries would be within the range of natural stream flows and would not constitute abnormal flows, no direct or indirect impacts to sensitive natural communities would occur.

Impact B-4: Loss of or Damage to Sensitive Fauna

There are approximately 52 species of threatened, endangered, or rare species and species of special concern that are known to occur in or adjacent to middle Piru Creek or have the potential to occur in the project region (Table 3.1-2). Some of these species, such as the arroyo toad, southwestern pond turtle, two-striped garter snake, and great blue heron, have either been observed or are known to occur in the study area. Of the 52 sensitive wildlife species that either occur or have the potential to occur in the middle Piru Creek area, only 12 sensitive species have a high enough likelihood of occurring in the proposed project area to warrant further discussion.

Fish

Species Sensitive

Arroyo chub. Arroyo chub, a State species of special concern and USFS sensitive species, was historically known to occur in middle Piru Creek. However, this species is not expected to occur in the proposed project area at this time. Historic flow regulation, water diversion, trout stocking, and large numbers of exotic aquatic predators have likely extirpated this species from middle Piru Creek. If this species were present, direct impacts to arroyo chub would not be expected to occur as a result of the proposed project. Arroyo chub are adapted to warm water conditions and natural disturbance that would occur from implementation of the proposed project. If arroyo chub were present, impacts could result from a temporary concentration of predator populations as the creek's augmented flows are reduced to match natural inflow into Pyramid Lake. However, under the current flow regime water releases into middle Piru Creek are already reduced to 5 cfs from October 9th through March 14th except for winter storms. With the exception of the driest years, implementation of the proposed project would not be substantially different from current conditions between October 9th and March 14th. Due to the unlikelihood of the arroyo chub occurring in the immediate project area and the temporary nature of concentrated predator populations, impacts would be considered less than significant.

No direct impacts to arroyo chub, if present, would occur from the delivery of water to United or periodic testing of the radial gates. As previously described, flows associated with both the test releases and water deliveries would be within the range of natural stream flows and would not constitute abnormal flows.

As the arroyo chub has been successfully transplanted to streams outside of its range, and the likelihood of impacts from the proposed project threatening regional populations of the arroyo chub is minimal, direct impacts to this species would be considered less than significant and no mitigation is proposed. In

fact, the proposed project may create conditions through the removal of exotic predators, the re-establishment of suitable substrate for breeding in downstream sections of middle Piru Creek, and the return to natural stream processes that would make middle Piru Creek a suitable site for reintroduction of the arroyo chub. Over time, it is expected that the stream would naturally create pools and develop aquatic vegetation in locations downstream from Pyramid Dam that could support populations of this species if reintroduced.

Amphibians

Federally and State Listed as Endangered or Threatened

Arroyo toad. Arroyo toad, a federally endangered species, is known to occur in middle Piru Creek upstream of Bluepoint Campground. Arroyo toads are extreme habitat specialists and require a unique combination of biological and physical factors for successful reproduction, development, and survival. Restoring natural stream processes to middle Piru Creek to benefit arroyo toad is a primary goal of the proposed project. Implementation of the proposed project would directly benefit the arroyo toad by restoring simulated natural stream flows to middle Piru Creek. No significant direct or indirect adverse impacts to arroyo toad are expected to occur from implementation of the proposed project.

Existing conditions at many locations along middle Piru Creek are no longer favorable for arroyo toad and have substantially affected the juvenile and adult success of this species (USFWS, 2003). Sweet (1992) identified several habitat features required for successful reproduction of arroyo toads including shallow, sand or gravel filled pools with sparse vegetation, minimal currents, and a moderate riparian canopy leaving most of the pool exposed to the sky. Along middle Piru Creek the long-term impacts of the modified hydrologic regime have substantially altered the composition of the streambed and adjacent riparian communities. Attenuated winter storms and regulated flow regime have resulted in riparian vegetation encroaching into portions of the creek that historically were kept relatively free of vegetation by natural stream processes. Coupled with augmented summer flows, this has led to an increase in the density of wetland and riparian vegetation on sand and gravel bars previously used by arroyo toads.

Implementation of the proposed project would restore the natural geomorphic disturbance required for the development of suitable breeding pools and foraging habitat for the arroyo toads Natural flooding events have been directly linked to formation of appropriate breeding pools, maintenance of unvegetated lower stream terraces, and deposition of friable soils through periodic scour and redistribution of sediments in the stream channel (Jennings and Hayes, 1994; USFWS, 2001) In addition, increased disturbance from winter storms could result in the development of secondary channels and shallow rearing pools required by tadpoles and juvenile toads. Although natural storm events would be attenuated and peak flows would be subject to a lag period of up to one day as a result of operational constraints, flows downstream of Pyramid Dam would not be substantially different from natural flows and would result in adverse impacts to arroyo toads. Reduction of riparian vegetation through scouring would also benefit arroyo toad, as heavily shaded pools are unsuitable for reproduction. Dense riparian vegetation can shade pools, lower water temperatures, and cause poor development of the algal mats required for foraging; such areas are often avoided by calling males (Sweet, 1992). Storm-related disturbance would also have the potential to restore stream terraces and low-lying sand bars, which provide critical habitat for juvenile toads. The importance of sand bars and stream terraces cannot be understated as the successful recruitment of juveniles is strongly tied to the presence of this habitat (Sweet, 1992). Sand bars and terraces that retain high moisture content from capillary action and have limited vegetation cover are used by juveniles to control their body temperature and may provide hiding places from predators. Implementation of the proposed project would provide beneficial impacts through the restoration of natural fluvial processes. Although natural

fluvial processes would largely be restored to middle Piru Creek, one critical requirement for arroyo toad is the presence of sandy friable soils. Pyramid Dam currently blocks the natural importation of granitic fines, gravel, and small cobble into middle Piru Creek. These sediments are critical for the development of sandy bars, terraces, and breeding pools used by arroyo toads. Hydraulic analysis of sediment transport in middle Piru Creek supports the finding that existing sediment loads from upstream reaches of middle Piru Creek below Pyramid Dam and secondary sources including Agua Blanca Creek would probably provide the required granitic fines needed to maintain suitable arroyo toad breeding soils for many years in the southern reaches of middle Piru Creek (see Section 3.2.4.3 for a complete discussion of sediment transport along middle Piru Creek). However, upstream reaches of middle Piru Creek, particularly below Pyramid Dam, would continue to lose sediment at higher rates from the increase in frequency and duration of winter storms. This would eventually lead to severe bank erosion and channel degradation in this area and possibly result in a boulder- and cobble-dominated creek channel. However, arroyo toads no longer occur in Frenchman's Flat and upstream reaches of middle Piru Creek, and successful colonization by this species is unlikely to occur in this area because is heavily subjected to recreational activities such as camping, picnicking, swimming, and fishing. This area also supports the "put and take" and "catch and release" trout fishery.

Simulating natural stream flows would eliminate the artificial summer flows that occur in middle Piru Creek. Under the current flow regime CDWR releases 25 cfs of water below the dam from April 1st through August 31st. Augmented summer flows have lead to the expansion of riparian vegetation, channel incision, bank undercutting, and increased water velocities. Arroyo toads require low current velocity for successful tadpole and juvenile development. Arroyo toads prefer breeding areas with minimal current velocities and place egg masses in areas where the eggs remain in contact with water but are protected from excessive stream flows. The existing flow conditions that occur along middle Piru Creek during the summer are deleterious to tadpole and juvenile arroyo toads. Increased summer flows prevent access to calm edge waters, inundate preferred breeding and rearing habitat, and sweep tadpoles downstream. Under simulated natural conditions, stream flows would decline through the summer months and provide low velocity pools and access to moist sandy terraces. Although natural stream systems can undergo a wide variation in summer current velocities, receding streams can result in the stranding and desiccation of egg masses or tadpoles. Similarly, spring and summer storm events would result in increased flows that have the potential to wash tadpoles and juvenile toads downstream. However, these are natural processes and would not be considered an adverse impact. Therefore, the restoration of natural flows along middle Piru Creek and the elimination of summer water releases would be anticipated to result in beneficial impacts to arroyo toad.

Periodic testing of the radial gates on Pyramid Dam is not expected to impact arroyo toads. The maximum amount of water that would be released from the dam during any test would consist of 50 cfs for 15 minutes. However, testing typically consists of smaller releases (5 to 20 cfs for approximately five minutes or less). In addition, test releases would be avoided between March 15th and July 31st, to avoid potential impacts to breeding toads. However, emergency circumstances could arise where such releases are unavoidable during this period. In such instances, the USFWS would be notified promptly.

Test releases, even under emergency circumstances, would consist of a short-term release of water that would be similar to a very small natural rain event and would not result in substantial changes to water surface elevations along middle Piru Creek (see Section 3.2.4). Although water surface elevations immediately below the dam would increase, it is unlikely that water from test releases would be measurable several miles downstream of Pyramid Dam where arroyo toads are known to occur. As water flows downstream, the flows would be attenuated by a combination of natural processes including ground water recharge, evapotranspiration, and evaporation. For example, a review of pre-dam USGS

stream gauge data for Piru Creek indicated that while flow was recorded in upper Piru Creek, little or no flow was recorded above Lake Piru the same period. In addition, under existing conditions between 35 and 50 percent of water released from Pyramid Dam does not reach the stream gauge above Lake Piru during summer months. Therefore, test releases as proposed for the proposed project would not pose a substantial risk of impact to arroyo toads.

Scheduled deliveries of Table A water to United would also occur between November 1st and February 28th each year. Although the Table A water would be transported downstream during this period, releases would probably be scheduled to resemble natural storm events and would not result in substantial changes to the creek's hydrology. Alternatively, water deliveries could be spread out over several months during the winter season when arroyo toads are not present in the creek channel. This alternative would add approximately 13 cfs to the natural flow during this period. As both test releases and water deliveries would be within the range of natural stream flows expected to occur during this period and arroyo toads would probably not be present during in middle Piru Creek at this time of year, no direct impacts to this species would occur.

Beneficial impacts to arroyo toad would also occur from the reduction of aquatic predators including non-native species such as bullfrogs, red crayfish, and largemouth bass. Exotic predators pose a significant threat to arroyo toad populations along middle Piru Creek and are second only to the effects of flow regulation (Sweet, 1992). Simulated natural flows would provide for an increase in the frequency and return period for winter storms and a decrease in summer flows. Large winter storms have the potential to flush exotic fish and amphibians downstream prior to the reproductive period for arroyo toads. Bullfrog tadpoles spend up to two years in a stream prior to metamorphosis compared to approximately three to four months for arroyo toads and other native amphibians. Similarly, juvenile and adult arroyo toads are inactive during the winter season and move into adjacent upland habitat to aestivate. This behavior allows the toads to avoid periods of cold water temperatures and disturbance from winter storms. In addition, a reduction in summer flows would reduce bullfrog and other non-native predators that require the continuous presence of water. Historic flow data indicate that middle Piru Creek is occasionally subject to periods of little or no flow. Consequently, sections of the creek may dry out during the late summer and fall months. This would reduce populations of aquatic predators by desiccation and increased water temperatures. Although deep pools and canyon reaches may retain water during periods of reduced inflow and provide summer refugia for aquatic predators, the overall reduction in predator populations would benefit the arroyo toad.

California red-legged frog. California red-legged frog, a federally threatened and State species of special concern, is known to have historically occurred in middle Piru Creek. However, limited surveys of middle Piru Creek did not identify egg clutches, tadpoles, or adults in or near the channel, and increases in aquatic predators including crayfish, bullfrogs, and largemouth bass may prevent this species from now occurring in the creek (United, 2002). Populations of this species are also known to occur in Agua Blanca Creek, a tributary to middle Piru Creek located 16.5 miles downstream of Pyramid Dam. If present, no significant impacts to this species would be expected to occur from implementation of the proposed project.

Simulation of natural flows in middle Piru Creek would increase winter flows, scouring, and natural removal of riparian vegetation. California red-legged frogs use riparian vegetation along the banks of ponds and streams for breeding and shelter. However, bullfrogs also use this habitat extensively and are a known predator of all life stages of California red-legged frogs. The loss of riparian vegetation that can be used by California red-legged frogs in the proposed project area would be offset by the reduction of predators such as bullfrogs.

California red-legged frogs typically breed between late November and early April, which would coincide with maximum flows of the creek under the proposed project. Although large winter storms do have the potential to wash egg masses and larvae downstream, these events occur naturally and would not be considered an impact. In addition, amphibians and other riverine species typically have life histories that enable individuals to survive and reproduce within a range of environmental conditions common to stochastic systems (Townsend and Hildrew, 1994). For ranid frogs on the Trinity River, reproductive behavior was linked to the intensity of winter rainfall. During periods of high precipitation, frogs delayed laying eggs until the river had receded; conversely, egg clutches were laid early during periods of minimal rainfall (Kupferberg, 2004). Reduced summer flows would also closely resemble historic conditions along middle Piru Creek. Although California red-legged frogs are rarely observed outside aquatic habitats, this species is able to persist during periods of reduced flows and drought by seeking shelter in mesic areas such as adjacent riparian vegetation, spaces under creek boulders, and moist soil (United, 2002; Hunt, 2004). As water surface elevations recede and pools dry up, there may be a temporary increase in the concentration of aquatic and terrestrial predators such as bullfrogs, raccoons, and shore birds. However, as previously described, under the current flow regime, creek flows are reduced to 5 cfs between October 10th and March 15th except for winter storms. Therefore, while potentially adverse impacts during this period may occur if this species were present, these impacts would not be considered significant as conditions along middle Piru Creek would not change substantially from current conditions.

No impacts to red-legged frogs would occur, if present, from the delivery of water to United, periodic testing of the radial gates, or the approximate one to two day lag time between measured inflow and outflow. As previously described, flows associated with both the test releases and water delivery would be within the range of natural stream flows and would not constitute abnormal flows. Likewise, a lag time or reduction in peak winter storms in the creek due to operational constraints of Pyramid Dam would not be substantially different from natural creek conditions.

Restoring natural flows to middle Piru Creek would also provide beneficial effects to this species, if present, from restored stream processes including the development of natural pools, increased summer water temperatures required for juvenile development, and the recruitment and establishment of native riparian vegetation. Perhaps most importantly, implementation of the proposed project would reduce populations of exotic predatory species such as largemouth bass, crayfish, and bullfrogs. Therefore, no adverse significant impacts to this species are expected, and no mitigation is proposed.

Reptiles

Federally and State Listed as Endangered or Threatened

There are no federal or State listed as endangered or threatened reptiles with the potential to occur along middle Piru Creek. Therefore no impacts would occur.

Sensitive Species

Southwestern pond turtle. Southwestern pond turtles are known to occur along middle Piru Creek and have been identified at several locations during surveys conducted by CDWR (CDWR, 2002, 2004; Aspen, 2004). Pond turtle populations have declined during the past forty years in southern California, primarily due to loss of habitat from live stock grazing, water diversion, and dam construction. In fact, only six to eight viable populations currently exist south of the Santa Clara River system (Spinks et al., 2003). The current flow regime of middle Piru Creek has resulted in the development of deep, incised channels with undercut banks and swift water. Southwestern pond turtles, however, prefer deep, slow

flowing, warm pools with underwater refugia and suitable basking sites (Reese and Welsh, 1998). Attenuation of storm flows and summer flow augmentation to support the existing trout fishery has led to the encroachment of riparian vegetation on the channel banks and the possible loss of suitable basking sites along portions of middle Piru Creek. Summer flow augmentation has also resulted in increased populations of exotic predators including bullfrogs, largemouth bass, and red crayfish. In addition, due to the reduction and attenuation of winter flows, seasonally flooded areas have been eliminated, thereby reducing the potential for development of small pools and slow moving secondary channels, habitat often used by this species. This may reduce the number of basking sites needed for pond turtles to control their body temperature. Summer water releases from Pyramid Dam also tend to lower water temperatures in middle Piru Creek. Turtles exposed to lower water temperatures require additional basking time to maintain core body temperatures. This increases the risk of predation, especially when basking sites are restricted to the edges of swiftly flowing creek channels, and can have detrimental effects on juvenile turtles.

Adult pond turtles are considered to be relatively safe from predation and believed to be long-lived. This belief is supported to some degree by findings that the population structure of most pond turtle populations includes a high percentage of adults (Bury, 1972). However, juvenile pond turtles are preyed on by a variety of aquatic and terrestrial predators and require slow moving water to forage effectively (Hunt, 2004). Juvenile pond turtles may be unable to reach suitable basking sites along middle Piru Creek in areas with fast water. This would reduce or preventing the basking behavior essential for survival and growth while substantially increasing the exposure to aquatic predators such as bullfrogs and largemouth bass.

Implementation of the proposed project would benefit the southwestern pond turtle in several ways. Beneficial effects to this species include the reduction of aquatic predators and the development of a slow flowing, warm-water natural stream channel. Increased winter storms would also result in the deposition of logs, boulders, and other areas suitable as basking sites and provide for the establishment of native riparian and upland vegetation along the creek channel. Sediment deposition in the lower reaches of the creek could also facilitate the development of friable terrace soils suitable for egg-laying and over-wintering. While summer flow augmentation below Pyramid Dam does provide deep water shelter, habitat suitability is probably compromised in many sections of the creek by the elimination of the slow flowing edge water required by juvenile pond turtles (Reese and Welsh, 1998) and by reduced water temperatures.

In addition, consistent summer flows have substantially increased populations of exotic aquatic predators. Simulating the natural flows of middle Piru Creek would reduce predator populations by removing riparian and wetland vegetation preferred by aquatic predators such as bullfrogs, flushing exotic species downstream during large winter storms and killing bullfrog tadpoles by desiccation during periods of low flows. During periods of low flow, sections of middle Piru Creek may dry up and water would be limited to isolated pools and low flow channels. This would effectively reduce populations of bullfrogs, crayfish, and exotic fish such as largemouth bass. Southwestern pond turtles are adapted to changing stream conditions and can survive short periods when water is reduced or absent by seeking refuge in moist soil, under rocks, or in leaf littler (Hunt, 2004).

No impacts to southwestern pond turtles would occur from the delivery of water to United or periodic testing of the radial gates. As previously described for amphibians, flows associated with both the test releases and United's water deliveries would be within the range of natural stream flows and would not constitute abnormal flows. Likewise, a lag time or reduction in peak winter storms from operational constraints of Pyramid Dam would not be substantially different from the natural conditions of the creek.

The simulation of natural flows would ultimately provide beneficial impacts to the overall creek system. Most pond turtle populations in southern California appear to be dominated by mature adults, which suggests longevity but also suggests a lack of successful recruitment by juveniles. This has been linked to large numbers of aquatic predators, specifically bullfrogs and crayfish (Hunt, 2004; Sandburg, 2004). The removal of aquatic predators, including crayfish, bullfrogs, and largemouth bass would probably improve the reproductive success of existing pond turtle populations over time. Therefore implementation of the proposed project would probably result in an overall net benefit to southwestern pond turtles occurring along middle Piru Creek. As such, no adverse significant impacts are expected to occur from implementation of the proposed project, and no mitigation is proposed.

Two-striped garter snake. The two-striped garter snake is a State species of special concern that is known to occur in the proposed project area. Direct effects to the two-striped garter snake are unlikely to occur as a result of the proposed project. Disturbance from the proposed project would be associated with natural stream processes and would occur over an extended time. Creek flows resulting from development of the proposed project would simulate the pre-dam hydrologic condition of middle Piru Creek. Although peak flow periods and intensities would be increased in comparison to existing conditions, stream gauge data suggests that peak flows would not differ significantly from historic flows.

Other effects such as changes in riparian structure and the alteration of streambed morphology would probably not result in adverse impacts on the two-striped garter snake. Two-striped garter snakes are not dependent on standing water for survival and are often found on ephemeral streams and near vernal pools. Although simulating the natural flows in middle Piru Creek may temporarily reduce some foraging opportunities, the beneficial effects on the species would be long-term, similar to those described previously for other amphibians and reptiles. These benefits include the removal of aquatic predators known to prey on juvenile garter snakes, as well as development of natural stream channels, seasonal pools within the floodplain for summering, and upland mounds and native riparian vegetation for wintering. No impacts to two-striped garter snake would occur from United's water deliveries or periodic testing of the radial gates. As previously described, flows associated with both the test releases and water deliveries would be within the range of natural stream flows (Section 3.2.4) and would not constitute abnormal flows and would not impact this species. Likewise, the approximate one to two day lag time or reduction in peak winter storms from operational constraints of Pyramid Dam would not be substantially different from natural creek conditions. Therefore, impacts to this species would be considered beneficial. No adverse significant impacts are anticipated, and no mitigation is proposed.

Birds

Federally and State Listed as Endangered or Threatened

California condor. California condor is a federally listed endangered species, as well as a State endangered and fully protected species. California condors have been reintroduced to the Los Padres National Forest and have been observed flying in the vicinity of middle Piru Creek. The species may occasionally use the project area for foraging and roosting although no activity in the area has been recorded. Condors do not typically forage in the steep canyons common to middle Piru Creek; they prefer higher altitude areas with substantial open ground (USFS, 2004). Restoring natural flows to middle Piru Creek would not substantially alter habitat used by the condor or be likely to affect the population density or type of prey they require. Additionally this species would not be directly or indirectly effected by United's water deliveries, the testing of Pyramid Dam's radial gates, or the potential lag time between recorded inflow and resulting outflow because these actions would not substantially change the overall natural hydrology of the creek (Section 3.2.4). Therefore, direct

adverse impacts are unlikely and would not be considered significant. Therefore, no mitigation is proposed.

Beneficial impacts to condors may indirectly result from reduced recreational use of Frenchman's Flat. Reduced summer flows would lower stream elevations and may reduce recreational activities including fishing, swimming, picnicking, and camping. This may result in a reduction in trash and food waste that has been known to attract condors in other parts of the Los Padres National Forest.

Southwestern willow flycatcher. Southwestern willow flycatcher is a federally listed endangered species that is obligate to riparian habitats with dense growths of willows, cottonwoods, and riparian scrub species. Suitable habitat, artificially supported by summer flows, now occurs on sections of middle Piru Creek and this species has been repeatedly sighted at several locations below Pyramid Dam. However, there are no historic records of nesting southwestern flycatchers in this area, and it is believed that middle Piru Creek is used as migratory pathway to the Central Valley (United, 2002). USFS biologists may have identified a possible nesting pair of southwest willow flycatchers along middle Piru Creek near the confluence of Aqua Blanca Creek in 2002, but this pair was not present in 2004 (USFS, 2004).

Direct and indirect impacts to southwestern willow flycatcher are not expected to occur from restoring natural flows in middle Piru Creek. Although southwest willow flycatchers have been documented as summer migrants, the presence of successful nesting birds has not been confirmed. Therefore, direct adverse impacts to this species are not expected, and no mitigation is proposed.

If southwest willow flycatchers were determined to be currently nesting along middle Piru Creek, it is difficult to predict what potential indirect effects would occur as the composition and structure of riparian habitat changes over time. Likewise, it is difficult to predict the scale or time frame of any potential impacts. Augmented summer flows and reduced levels of disturbance from storm flow attenuation have promoted the formation of a heavily vegetated riparian corridor along sections of middle Piru Creek. This artificially supported habitat has the potential to support nesting southwest willow flycatcher. However, impounded waterways tend to produce more stable systems that may eventually lead to decreased biodiversity and development of monotypic stands of late successional species. The proposed project may ultimately lead to a reduction or change in the structure of riparian communities as summer flows return to historic levels. This would provide beneficial impacts to the arroyo toad but may result in unfavorable conditions for southwestern willow flycatchers.

Riparian communities subject to periodic disturbance typically provide a more complex community structure containing multiple successional states, which could include some suitable flycatcher habitat. Conversely, a single flood may remove substantial areas of riparian vegetation; if followed by low stream flows, there could be reduced recruitment. Under this scenario, possible nesting habitat could be lost. However, predicting at what time or scale these impacts might occur is difficult and considered speculative.

Based on historic records of southwest willow flycatchers and a review of pre-dam flow data, it is unlikely that pre-dam conditions on middle Piru Creek would have supported nesting populations of southwest willow flycatcher (Haas, 2004). Riparian habitat along middle Piru Creek appears to have substantially changed from historic conditions as summer flows released from Pyramid Dam have caused expansion of riparian habitat in the proposed project area, specifically along the banks of the creek. However, several sections of middle Piru Creek do contain stream terraces that support extensive galleries of cottonwoods and willows that pre-date the construction of Pyramid Dam. Similarly, reduced disturbance from winter flow attenuation has promoted the establishment of riparian

vegetation in and adjacent to some of these galleries. It is possible that because of the extended period of controlled flows and lack of disturbance below Pyramid Dam (approximately 30 years), large riparian trees whose roots maintain contact with potentially receding water levels would be more drought tolerant and could persist following the restoration of natural flows. This would have the effect of moderating the overall change in riparian habitat over time.

However, historic conditions on Piru Creek did not appear to provide suitable nesting habitat for this species. Although a single nesting pair of southwestern willow flycatchers has been identified on middle Piru Creek and substantial changes to riparian habitat may occur over a decade or more, a comprehensive discussion on the potential impacts to southwestern willow flycatchers is considered speculative, which is discouraged under CEQA (CEQA Guidelines Sections 15144 and 15145). No mitigation for this species is therefore proposed.

Least Bell's vireo. Least Bell's vireo is a federally and State endangered migratory bird that nests in riparian habitat with a dense understory of sandbar willow, mule fat, willow saplings, and other low vegetation. This species is currently restricted in distribution to southern California and northwestern Baja California (USFWS, 2003); however, non-nesting individuals of this species have been identified in the lower reaches of middle Piru Creek (United, 2002). If present, indirect impacts would be similar to those identified for southwest willow flycatcher. As this species has not been identified nesting along middle Piru Creek, direct impacts to this species are not expected to occur; if nesting birds of this species were present, potential impacts of the proposed project on them or their nesting habitat would be speculative. Therefore, no mitigation is proposed.

Western yellow-billed cuckoo. The western yellow-billed cuckoo is a rare fall and summer migrant through riparian areas in California. This species has not been observed in the project study area and is only known to occur in the Central Valley; along the Amargosa River, Feather River, Kern River, and Lower Colorado River; and occasionally at Prado Basin (located in Orange and Riverside Counties). Due to the rarity of this species and lack of recent observations in Ventura and Los Angeles Counties, it is unlikely that the species would occur at middle Piru Creek or that it would be adversely affected by the proposed project. Therefore, no mitigation is proposed.

Sensitive Species

Great blue heron and great egret. Great blue heron and great egret were observed within the study area. Impacts to these species would include the possible reduction in summer flows, freshwater marsh, and open water habitats along middle Piru Creek. Impacts to these species may be adverse but would not be considered significant because restoring natural flows would not eliminate all foraging habitat. Also, it is possible that concentration of prey species in the remaining pools and freshwater marsh when flows are low would compensate for the reduction in area of foraging habitat. In addition, suitable habitat for these species would remain in nearby areas, including Lake Piru. While these species are considered species of special concern, they are relatively common to the area and restoring natural flows is not expected to threaten their regional populations. No impacts to these species would be anticipated to occur, and therefore no mitigation is proposed.

Yellow warbler. The yellow warbler is a migratory bird that nests in willow and cottonwood riparian habitats. This species is a rare nester in southern California although it has been observed in the proposed project area. However, direct and indirect impacts to this species from implementation of the proposed project are not expected to occur. Although there is the potential for some loss of nesting habitat as riparian communities return to historic conditions, changes in riparian structures are not likely to substantially alter the preferred habitat of this species. Similarly, changes to riparian structure

are expected to occur gradually and would not eliminate nesting habitat from the proposed project area. Impacts to yellow warbler may be adverse if large areas of riparian habitat were removed during storm events, but they would not be considered significant as they would be the result of natural stream processes. Therefore, no mitigation is proposed.

3.2 WATER RESOURCES

3.2.1 Introduction

Piru Creek, a tributary to the Santa Clara River in California, drains a mountainous area approximately 437 square miles in size in Los Angeles and Ventura Counties. The drainage area is mostly undeveloped. The creek flows generally southward to enter the Santa Clara River approximately 30 miles upstream of the Pacific Ocean. River flows are controlled by Pyramid and Santa Felicia Dams, both constructed for the purpose of water supply and recreation. Pyramid Dam is located on Piru Creek approximately 24 miles upstream of its confluence with the Santa Clara River, at a point where the Piru Creek upstream watershed area is approximately 295 square miles. The primary sources of water flowing into Pyramid Lake are upper Piru Creek, Cañada de los Alamos, the West Fork of Liebre Gulch, Gorman Creek, and the West Branch of the California Aqueduct.

Lake Piru, which is formed by Santa Felicia Dam, is located on Piru Creek approximately 18 miles downstream of Pyramid Lake, beginning at a point where the creek's upstream watershed area is approximately 370 square miles. The following analysis is confined to Pyramid Lake, middle Piru Creek, and Lake Piru. This section discusses existing conditions regarding water resources in the proposed project area and the potential impacts of the proposed project as it relates to water resources.

3.2.2 Environmental Setting

Hydrology

The climate of the Piru Creek watershed is typical of Southern California in that rainfall is highly seasonal. Almost all rainfall comes in the winter, and summers are typically very dry. The Piru Creek watershed is mountainous. At higher elevations, some winter precipitation arrives as snow; and although there is some summer precipitation in the form of thunderstorms, the basic pattern is one of wet winters and dry summers. The rainfall pattern is reflected in the resultant natural flows in Piru Creek as recorded by USGS gauges in the proposed project area. USGS gauges are located at the following locations (USGS, 2004) and, except as otherwise stated, were used as the basis for the hydrologic data presented in this analysis:

- USGS Gauge #11109375. This gauge is on upper Piru Creek above Pyramid Lake and below Buck Creek. At this location the watershed area is 198 square miles. The available period of record for this gauge is 1976 to 2003. Records include daily streamflow and annual flow peaks.
- USGS Gauge #11109395. This gauge is on Cañada de los Alamos just above Pyramid Lake. At this location the watershed area is approximately is 62 square miles. The available period of record for this gauge is 1976 to 2003. Records include daily streamflow and annual flow peaks.
- USGS Gauge #11109525. This gauge is on middle Piru Creek just below Pyramid Dam. At this location the watershed area is 295 square miles. The available period of record for this gauge is 1988 to 2003. Records include daily streamflow and annual flow peaks.
- USGS Gauge #11109550. This gauge is on middle Piru Creek just above Frenchman's Flat. At this location the watershed area is 308 square miles. The available period of record for this gauge is 1976 to 1978.

Records include daily streamflow and annual flow peaks. The period of record on this gauge was so short that the information was not used in this analysis.

- USGS Gauge #11109600. This gauge is on middle Piru Creek just above Lake Piru. At this location the watershed area is 372 square miles. The available period of record for this gauge is 1955 to 2003. Records include daily streamflow and annual flow peaks.

A new gauge has been constructed recently downstream of Pyramid Dam. Because this gauge is new, there are no data for it yet.

Figure 3.2-1 shows average monthly inflows to Pyramid Lake after 1995, which is when the current release protocol, described below, began. Inflow data are from upper Piru Creek and Cañada de los Alamos at the point where these two streams enter Pyramid Lake (USGS, 2004). The total watershed area for these two gauges is 260 square miles. An additional 35 square miles, represented by Liebre Gulch and other tributaries, drains to the lake downstream of these gauges. The flow into Pyramid Lake represented in Figure 3.2-1 is adjusted for this extra watershed area. It is assumed for purposes of the adjustment that the ungauged 35 square miles contributes flow at a rate equivalent to the contribution of the gauged watershed, adjusted for area. Since the total watershed, 295 square miles, is 13 percent larger than the gauged watershed, the gauge data were increased by a factor of 1.13 to account for the ungauged portion of the watershed. Figure 3.2-1, which also shows monthly inflows to Lake Piru, clearly shows the seasonality of the flows. During the available period of streamflow records, flows into Pyramid Lake have never been below 1 cfs. Upper Piru Creek flows into the lake were zero during the summers of 1989 and 1990, but the Cañada de los Alamos did not go dry and provided at least 1 cfs during those periods. Flow was recorded on upper Piru Creek and Cañada de los Alamos on all other days of record.

The current release schedule from Pyramid Dam is described in this EIR's Project Description (Section 2). Winter releases from Pyramid Dam consist of a base flow of 5 cfs, which is augmented as follows: (1) storm-generated inflow into Pyramid Lake is generally released as soon as practicable, except that the amount of water released into middle Piru Creek during the summer in excess of summer inflow into Pyramid Lake is recouped from the first storm event or events of the following rainy season; (2) water deliveries to United may be made during the winter; and, (3) under conditions when United is unable to put natural inflows into Pyramid Lake to beneficial uses (defined as conditions under which water is spilling over Santa Felicia Dam and there is a continuous flow of water from Santa Felicia Dam to the Pacific Ocean), CDWR may appropriate water from upper Piru Creek and store it in Pyramid Lake under its water rights. Releases from the Dam are generally constant at 25 cfs in summer.

Figures 3.2-2 and 3.2-3 illustrate seasonal flows graphically for example years 1997 and 1998. Figure 3.2-2 represents inflow and outflow to Pyramid Lake for 1997. The year 1997 was similar in total volume to the five water years from 1996 to 2002 in which inflow to Pyramid Lake was less than outflow (Figure 3.2-4). Figure 3.2-4 shows total inflow and outflow since the current Pyramid Lake operation protocol was adopted. Figure 3.2-2 shows that four runoff events entering the lake on October 30th, November 23rd, and December 11th and 22nd were retained in the lake to compensate for the previous summer's releases. Events occurring later in the season were released at a delay and at lower peak rates than the inflow. On March 4th, inflow decreased below 25 cfs, but outflow was kept at 25 cfs until September 1st, dropping to a level approximately equivalent to inflow by October.

Figure 3.2-3 represents inflow and outflow for 1998. The year 1998 was an unusually wet year (see Figure 3.2-4) in which storage in the lake was accumulated by releasing less water than was taken in.

Placeholder for Figure 3.2-1 Piru Creek Average Monthly Discharges for Water Years 1996 to 2002

Figure 3.2-2 Pyramid Lake Inflow/Outflow for Water Year 1997

Figure 3.2-3 Pyramid Lake Inflow/Outflow for Water Year 1998

Figure 3.2-4 Pyramid Lake Total Annual Inflow/Outflow

The magnitude of the difference between the 1998 and 1997 years can be observed by comparing the y-axis scales on Figures 3.2-2 and 3.2-3. In the 1998 water year, three small events, occurring on November 27th, December 1st and January 10th were retained in the reservoir. A large flow event occurring on December 6th was released into middle Piru Creek immediately, but at a lower rate than the inflow. Subsequent events, even larger than the December 6th event, were also released immediately but attenuated. One event, occurring on February 8th, was released at a higher rate than the inflow. Outflow was fixed at 25 cfs on April 15th, rising to 30 cfs on September 11th, and then dropping to 6 cfs on October 7th. Inflow to the lake exceeded outflow for most of the year, including the summer, with the exception of the month of August.

There were no State Water Project Table A water deliveries to United in 1997 or 1998. According to the CDWR, during the past ten years, purchased water deliveries to United were as follows:

- Year 1994 to 1999, zero acre feet delivered;
- Year 2000, 2,200 acre feet delivered;
- Year 2002, 3148 acre feet delivered; and,
- Year 2003, 9918 acre feet delivered (includes 6,768 acre feet from another agreement with Castaic Lake Water Agency and 3,150 acre feet State Water Project Table A water to United).

Calendar year 2002 deliveries began on July 16th and ended November 9th and never exceeded 20 acre feet per day, or 10 cfs. Maximum total release during that time was 25 cfs. Calendar year 2003 deliveries started May 21st with a 50 cfs release. Releases continued at approximately this rate to August 9th and then diminished gradually to zero by the end of September 2003.

Figure 3.2-5 illustrates dry season flows into and downstream of Pyramid Lake for the period 1989 to 2002 as represented by average August flows. August inflow to the lake averaged 8.4 cfs, with no year lower than 1.6 cfs. August outflow from the lake averaged 23.6 cfs, with no year falling below 12.9 cfs. Between 1989 and 1995, August inflow and outflow averaged 8.3 and 20.3 cfs, respectively After 1995, when the current operation protocol was instituted, August outflow averaged 27 cfs, with no year falling below 24.7 cfs. August inflow during that same period averaged 8.6 cfs.

August flows into Lake Piru are illustrated in Figure 3.2-6. Prior to construction of Pyramid Dam, August flows into Lake Piru averaged 1.9 cfs, with about 30 percent of the years having no flow at all in August. After construction of Pyramid Dam, average August discharge into Lake Piru was 19 cfs, with no August averaging less than 6.5 cfs. Since 1995, August flows averaged 27.5 cfs, with no August falling below 21.6 cfs.

Maximum annual instantaneous peak flow rates have been recorded at the USGS gauges described above. However, gauges below Pyramid Lake (USGS Gauges #11109525 and #11109550) only provide nine years of instantaneous peak flow data, making a meaningful comparison with lake inflow peaks difficult. Average daily flow records are available for a longer period and make a better comparison upstream and downstream of Pyramid Dam. Further, since a primary concern of this EIR is the potential effect of modified stream releases on the arroyo toad, it was important to identify potential changes in channel bed and overbank composition resulting from flood flows. An average daily flow, which represents a longer period of time to effect channel changes, was considered a more appropriate representation of flow hydrology than instantaneous peaks, which can be of short duration.

Figure 3.2-5 Piru Creek August Average Monthly Flows

Placeholder for Figure 3.2-6

Piru Creek Above Lake Piru (at Bluepoint Campground) August Monthly Flow Averages

Table 3.2-1 provides maximum daily discharges for each year of record indicated for the gauges above and below Pyramid Lake. Table 3.2-2 provides the same for inflow to Lake Piru prior to and after construction of Pyramid Dam. A Log-Pearson Type III statistical analysis was performed on the data in Tables 3.2-1 and 3.2-2 in order to estimate recurrence frequencies. The results for Pyramid Lake are presented in Table 3.2-3.

Table 3.2-1 Yearly Maximum Average Daily Flow into and Released from Pyramid Lake for Current (Without Project) Conditions

Year	Maximum Average Daily Flow, in cfs	
	Into Pyramid Lake	At Frenchman's Flat (Released From Pyramid Lake)
1988	57	20
1989	129	77
1990	106	95
1991	452	400
1992	7830	2920
1993	5096	3990
1994	333	150
1995	3993	3670
1996	811	502
1997	2318	525
1998	13755	6000
1999	156	100
2000	261	200
2001	2892	2610
2002	20	36

Source: USGS (2004)

Table 3.2-2 Yearly Maximum Average Daily Flow into Lake Piru (At Bluepoint Campground) for Current (Without Project) Conditions

Prior to Construction of Pyramid Dam		After Construction of Pyramid Dam		After Construction of Pyramid Dam (Continued)	
Year	Maximum Average Daily Flow, in cfs	Year	Maximum Average Daily Flow, in cfs	Year	Maximum Average Daily Flow, in cfs
1955	128	1974	1820	1993	3200
1956	704	1975	743	1994	231
1957	1070	1976	531	1995	7700
1958	3970	1977	504	1996	550
1959	1550	1978	4830	1997	680
1960	238	1979	1480	1998	15000
1961	316	1980	2850	1999	111
1962	9250	1981	264	2000	456
1963	261	1982	348	2001	5030
1964	184	1983	14000	2002	41
1965	3950	1984	246		
1966	1910	1985	147		
1967	864	1986	2000		
1968	183	1987	104		

Prior to Construction of Pyramid Dam		After Construction of Pyramid Dam		After Construction of Pyramid Dam (Continued)	
Year	Maximum Average Daily Flow, in cfs	Year	Maximum Average Daily Flow, in cfs	Year	Maximum Average Daily Flow, in cfs
1969	15600	1988	2200		
1970	4330	1989	97		
1971	790	1990	123		
1972	210	1991	755		
1973	2290	1992	6900		

Source: USGS (2004)

Table 3.2-3 Piru Creek Hydrology at Pyramid Lake for Current (Without Project) Conditions

Flood Return Period, In Years	Maximum Average Daily Discharge, In cfs	
	Above (Into) Pyramid Lake	At Frenchman's Flat (Released From Pyramid Lake)
100	53,800	18,000*
50	32,700	16,300
20	15,400	8,000
10	7,770	4,220
5	3,370	1,920
2	658	414

Based on Log Pearson Type III analysis (USGS, 1981) of streamflow data obtained from (USGS, 2004). Assumed regional skew = -0.1.
*The maximum safe release from Pyramid Dam is assumed to be maximum discharge = 18,000 cfs.
Below Pyramid Lake, 18,000 cfs is approximately a 60-year flood. Above Pyramid Lake, 18,000 cfs is approximately a 25-year flood.

The frequency analysis results for Pyramid Lake (Table 3.2-3) show a clear difference between flows into the lake and flows out of the lake. Inflow peaks are 1.6 to 2 times outflow peaks for the 2 to 50-year floods. Since outflow is limited by the maximum safe release of the dam (approximately 18,000 cfs, depending on the lake surface elevation at the time), the 100-year inflow is three times the 100-year outflow.

No clear difference was found between the pre-(Pyramid) dam and post-(Pyramid) dam data for the Lake Piru. Unlike the Pyramid Lake data, the two Lake Piru data series (Table 3.2-2) are separated in time and are of different lengths. This could introduce statistical variations that could mask the effect of Pyramid Dam, particularly on relatively short data series such as these.

Because of the uncertainty of the (pre- and-post- Pyramid Dam) Lake Piru hydrology, the Frenchman's Flat discharges were increased by a factor of 1.26, representing the relative increase in watershed area from Pyramid Lake to Lake Piru, and used to approximate existing-conditions hydrology for Lake Piru. These adjusted discharges for Lake Piru are represented in Table 3.2-4.

Hydraulics

The hydraulic analysis presented in this section consisted of a (1) floodplain mapping of middle Piru Creek and (2) hydraulic analysis of surveyed cross sections in the Frenchman's Flat and Bluepoint Campground areas. Floodplain mapping was conducted using the U.S. Army Corps of Engineers HEC-RAS computer program (USACE, 2002).

Table 3.2-4 Piru Creek Adjusted Hydrology at Lake Piru for Current (Without Project) Conditions

Flood Return Period, In Years	Maximum Average Daily Discharge, In Cfs
100	22,680
50	20,540
20	10,080
10	5,300
5	2,420
2	520

Adjusted from existing conditions flows downstream of Pyramid Lake adjusted for increased watershed area at Lake Piru. Maximum discharge from Pyramid Lake 18,000 cfs.

The middle Piru Creek floodplain analysis was conducted using stream cross sections taken from 7.5-Minute USGS topographic maps. The discharge mapped was the maximum safe release from Pyramid Dam of 18,000 cfs. A Mannings roughness coefficient of 0.075 was estimated from field observations and observations of aerial photographs as representative of the channel and overbanks within this area.

The floodplain and cross section locations for the middle Piru Creek floodplain mapping are shown in Figures 3.2-7 through 3.2-10. Cross section locations were chosen based on topographic characteristics of the channel and overbanks. The cross sections provide a representative characterization of the channel and overbank for the purposes of delineating the floodplain of an 18,000 cfs discharge. Cross sections were placed approximately 1,000 feet apart, with closer spacing in areas of high topographic complexity (for instance, bends and tributary inflow points). Cross section data were taken from the topographic maps in Figures 3.2-7 through 3.2-10.

The total floodplain area (18,000 cfs discharge) between Pyramid Dam and Lake Piru is 461 acres. Maximum flow depth averages 19 feet. Maximum flow velocity averages 11 feet per second. Flow top width averages 188 feet. At 11 feet per second, an 18,000 cfs discharge takes approximately 2.4 hours to travel from Pyramid Dam to Lake Piru.

Seven cross sections in the Frenchman's Flat area and four cross sections in the Bluepoint Campground area were field surveyed for detailed hydraulic analysis. These areas were chosen for reasons of accessibility and relevance to the biological evaluation for arroyo toad and its habitat. Figures 3.2-11 and 3.2-12 show the locations of these cross sections. Roughness coefficients were estimated from field observations and ranged from 0.04 to 0.15 in the overbank, and 0.05 to 0.085 in the channel. The energy slope for each cross section was assumed to be equal to the channel slope. Discharges evaluated for baseline (existing) conditions consisted of the discharges listed below Pyramid Lake in Table 3.2-3 for the Frenchman's Flat cross sections and the discharges for the Bluepoint Campground area listed in Table 3.2-4. These discharges are considered to represent the current hydrology at Frenchman's Flat.

Figures 3.2-13 and 3.2-14 present representative cross sections for the Frenchman's Flat and Bluepoint Campground areas, with water surface elevations shown. Frenchman's Flat Cross Section 5 (Figure 3.2-13) shows that under current conditions a 2-year flow is contained entirely within the channel banks. A 5-year flow inundates a portion of the left overbank but does not inundate an overbank terrace on the right. The 10-year to 100-year floods inundate the right overbank terrace to increasing degrees. Bluepoint Campground Cross Section L3 (Figure 3.2-14) shows several separate channels, as the creek is braided in this location. The 2-year flood is mostly contained within the main channel, but all other floods have the potential to enter any of the secondary channels.

Figure 3.2-7

18,000 cfs Floodplain Map 1 of 4

Figure 3.2-8

18,000 cfs Floodplain Map 2 of 4

Figure 3.2-9

18,000 cfs Floodplain Map 3 of 4

Figure 3.2-10

18,000 cfs Floodplain Map 4 of 4

Figure 3.2-11 Piru Creek – Upper Cross Section Locations

Figure 3.2-12 Piru Creek – Lower Cross Section Locations

Figure 3.2-13 Cross Section U5 Without-Project Water Surface Elevations

Figure 3.2-14 Cross Section L3 Without-Project Water Surface Elevations

Table 3.2-5 gives average baseline hydraulic conditions for the Frenchman's Flat and Bluepoint Campground areas for various return period floods. In the Frenchman's Flat area the channel is relatively incised with definite floodplain terraces on the sides. There is very little out-of-channel flow in the 2-year flood, but the 5-year to 100-year floods have increasing amounts of overbank flow. The Bluepoint Campground Area is incised in the lower portion (Cross Sections L1 and L2), but wide and braided in the upper portion (Cross Sections L3 and L4), resulting in more frequent and extensive overbank flow than for the Frenchman's Flat area.

Table 3.2-5 Average Baseline Hydraulic Conditions for Frenchman's Flat and Bluepoint Campground Areas

Flow Return Period, in Years	Maximum Flow Depth, in Feet	Total Flow Topwidth, in Feet	Channel Flow Velocity, in Feet Per Second	Left Overbank Flow Width, in Feet	Left Overbank Flow Velocity, in Feet Per Second	Right Overbank Flow Width, in Feet	Right Overbank Flow Velocity, in Feet Per Second
Frenchman's Flat Area							
2	3.1	61	4.0	7	0.3	8	0.4
5	5.8	123	6.6	32	2.4	44	1.3
10	7.8	205	8.4	59	3.6	74	2.4
20	9.8	251	10.2	76	5.2	100	3.6
50	12.7	333	12.6	110	6.9	139	5.0
100	13.2	342	12.9	115	7.3	139	5.2
BluePoint Campground Area							
2	2.6	99	4.5	29	1.1	25	1.4
5	5.0	224	7.5	64	2.1	105	2.5
10	6.8	314	9.5	70	3.0	190	3.6
20	8.7	378	11.5	76	3.9	247	4.9
50	11.6	427	14.2	90	5.1	282	6.8
100	12.1	432	14.6	92	5.3	286	7.1

Sediment Transport

Natural streams, with erodible banks and bed, transport sediment originating from the watershed and from the channel banks and bed. Streams that are in sediment equilibrium have sediment transport capacities that are approximately equivalent from stream reach to stream reach. In sediment-equilibrium streams, the sediment transported through a reach is equivalent to the supply, so the channel bed remains relatively stable. If the sediment supply is interrupted, such as by construction of a dam, the result will be a reduction in sediment supply to stream reaches downstream of the dam. The flowing water downstream of the dam, having a reduced sediment supply, may gather sediment from the channel banks and bed, causing stream degradation (lowering of the channel bed), which reduces the sediment transport capacity until a new equilibrium slope is reached. The channel bed may become armored, meaning the fine sediments are swept away, leaving coarser sediments that cannot be transported by the predominant flows.

Pyramid Dam, constructed in 1973, traps sediment, which over time results in stream morphological changes downstream of the dam. Channel degradation is likely an ongoing condition, downstream of the dam, with effects occurring first in the area immediately downstream of the dam, including Frenchman's Flat. As degradation occurs, more flows would be confined to the channel, with less frequent and less extensive overbank flooding and reworking of sediments, and a coarsening of the bed material. Possible effects of channel degradation can be seen in the cross sections and hydraulic results

presented in Table 3.2-5, where Frenchman's Flat floods are more confined to the channel, with narrower floodplains, than the Bluepoint Campground floods.

In order to determine baseline sediment transport characteristics and trends for middle Piru Creek, a sediment transport analysis was conducted for the Frenchman's Flat and Bluepoint Campground areas. The sediment analysis was based on representative sediment samples taken from the channel bed and overbank areas during the cross section survey.

The channel bed and banks are comprised primarily of coarse sands, cobbles, and boulders. The sample results showed that the channel bed in the upper Frenchman's Flat area, from approximately Cross Sections U7 to U4, is dominated by cobbles (2.5 to 10 inches in diameter; approximately 15 percent of the material), gravel (0.08 to 2.5 inches in diameter; approximately 75 percent of the material), and coarse sand (0.02 to 0.08 inch in diameter; approximately 9 percent of the material). These sediment sizes make up approximately 98.9 percent of the bed material. The adjacent overbank terrace is similar in composition but with sands and fine sands accounting for approximately 15 percent of the material. From approximately Cross Section U3 to Cross Section U1 in the Frenchman's Flat area, the bed and banks are slightly finer, being dominated by very coarse sand in the channel bed and medium to coarse sand in the terrace. Cobbles, gravel, and coarse sand make up approximately 90 percent of the bed material in the Bluepoint Campground area. The rest is sand and fine sand. The terraces adjacent to the main channel in these areas are slightly finer but still dominated by cobbles, gravel, and coarse sand.

The sediment transport analysis was conducted using the Meyer-Peter, Muller (MPM) bed-load function (SLA, 1982). This method uses the MPM equation to estimate a unit (per foot of flow width) discharge for sediment in cubic feet per second. This unit discharge was then multiplied by the appropriate flow topwidth to obtain a total sediment discharge. In addition to the MPM analysis, an estimate was made of the maximum particle size that could be moved by a particular discharge using an incipient motion analysis (SLA, 1982). The purpose was to obtain an estimate of sediment transport capacity for the channel bed and overbanks in order to: (1) determine whether bed and overbank sediments will move in various return-period floods; (2) determine relative sediment transport capacities for various return period floods; and (3) compare relative sediment transport capacities for the without-project and with-project condition, and between the Frenchman's Flat and Bluepoint Campground areas. Sediment transport rates estimated in this analysis should be considered relative for the purposes of the comparisons presented in this analysis only. These sediment transport rates should not be used for any other purpose.

Table 3.2-6 summarizes the results of the sediment transport analysis for existing conditions. In the Frenchman's Flat area there is effectively no overbank sediment transport for the 2-year flood, and very little for the 5-year flood, meaning that sediments outside the main channel, as illustrated in Figures 3.2-13 and 3.2-14, are not disturbed or reworked by flows except approximately once every five years or more. Overbank sediments in the Bluepoint Campground area are transported more frequently than those of Frenchman's Flat, due primarily to the wide, braided nature of the channel in the upper Bluepoint Campground area, as represented by Bluepoint Campground Cross Section L3 (Figure 3.2-14). There is a fairly close correlation between Frenchman's Flat and Bluepoint Campground. Whereas Bluepoint Campground total sediment transport rates listed in Table 3.2-6 are about 20 percent higher than those for Frenchman's Flat, the difference is primarily due to overbank sediment transport in the Bluepoint Campground area, rather than channel sediment transport, for which Frenchman's Flat is slightly higher. The slightly higher sediment transport capacity at Bluepoint Campground is to be expected given the higher discharge at Bluepoint Campground, where the watershed is approximately 25 percent larger than at Frenchman's Flat.

Table 3.2-6 Piru Creek Sediment Transport Analysis Summary for Current (Without Project) Conditions

Flood Return Period, Years	Frenchman's Flat Area Cross Section Averages				Bluepoint Campground Area Cross Section Averages			
	Left Overbank Sediment Transport, cfs	Channel Sediment Transport, cfs	Right Overbank Sediment Transport, cfs	Total Sediment Transport, cfs	Left Overbank Sediment Transport, cfs	Channel Sediment Transport, cfs	Right Overbank Sediment Transport, cfs	Total Sediment Transport, cfs
2	0.0	3.0	0.0	3.0	0.8	2.5	0.1	3.4
5	0.3	13.3	0.9	14.6	4.6	10.2	3.5	18.3
10	5.6	26.0	4.4	36.0	10.7	18.6	12.0	41.4
20	12.8	41.1	12.1	65.9	19.5	29.7	29.7	78.9
50	29.2	66.5	29.6	125.2	37.2	49.1	71.7	158.0
100	32.8	71.0	39.2	142.9	40.9	52.6	79.9	173.4

Table 3.2-7 shows the maximum rock size, in inches diameter, for various flows as estimated by the incipient motion analysis. For the channel, the movable sizes are very similar at Frenchman's Flat and Bluepoint Campground for the various return periods. Flows in the Bluepoint Campground area have more capacity to move sediment outside the channel due to the larger overbank flows in that area.

Table 3.2-7 Piru Creek Maximum Moveable Rock Size Summary for Existing (Without Project) Conditions

Flood Return Period, Years	Maximum Moveable Rock Size, in Inches, for Frenchman's Flat Area Cross Section Averages			Maximum Moveable Rock Size, in Inches, for Bluepoint Campground Area Cross Section Averages		
	Left Overbank	Channel	Right Overbank	Left Overbank	Channel	Right Overbank
2	0.0	2.8	0.0	1.3	2.8	0.6
5	1.1	6.0	1.3	3.3	6.0	2.0
10	3.3	8.5	3.1	5.2	8.7	3.5
20	5.1	11.4	5.3	7.2	11.6	5.5
50	7.4	15.5	7.9	9.6	15.8	9.0
100	7.8	16.2	8.4	10.2	16.5	9.6

3.2.3 Applicable Regulations and Significance Criteria

The proposed project involves no construction, fill, or mechanical reworking of the channel or floodplain, and in general only natural streamflows will be released into the creek. Aside from notification of the RWQCB, no water resources regulations apply. The Los Angeles RWQCB has been notified of the proposed project and provided with the opportunity to comment (Section 1.2.1). Should the RWQCB in its comments find that a Water Quality Certification is warranted, the CDWR will proceed with the needed application and coordination for its issuance.

The following significance criteria are based on CEQA Checklist identified in Appendix G to the CEQA Guidelines. Water resources impacts would be considered significant if the proposed project:

- Violates any water quality standards or waste discharge requirements.
- Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the

production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion of siltation on- or off-site.
- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
- Creates or contributes runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrades water quality.
- Places within a 100 year flood hazard area structures which would impede or redirect flood flows.
- Exposes people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Results in or is subject to inundation by seiche, tsunami, or mudflow.

3.2.4 Environmental Impacts and Mitigation Measures

Hydrology

Under the proposed project Pyramid Dam would be operated to simulate a natural flow regime downstream of Pyramid Lake to the extent operationally feasible and consistent with safety requirements. Inflow to Pyramid Lake would be released into middle Piru Creek at the same rate at which it enters the lake, up to the maximum safe release of approximately 18,000 cfs. Winter high flows below 18,000 cfs would not be attenuated unless there are safety concerns and summer stream releases from Pyramid Dam would not be augmented by release of additional water from the reservoir. Therefore, the flows into Pyramid Lake presented in Figures 3.2-1 through 3.2-5 are illustrative of the "with-project" condition. Summer stream releases into middle Piru Creek would be substantially reduced, to an average monthly low of approximately 8 cfs, with possible reductions to as low as 1 cfs, as opposed to the 25 cfs released under current conditions. The reduction in flows at Bluepoint Campground would be more dramatic due to in-transit losses. At Bluepoint Campground, summer flows would be reduced from the current 16 to 20 cfs averages (minimum recorded approximately 7 cfs) to averages of approximately 2 cfs. Further, based on historic records of Piru Creek before construction of Pyramid Dam, summer flows would be more erratic than they are currently. Under the proposed project, there may be summer periods of no flow lasting one month or more at Blue Point Campground in approximately one-third of the years. Discharges prior to 1974, as shown in Figure 3.2-6, would be representative of with-project summer flows at the Bluepoint Campground.

Maximum average daily flow rates presented in Tables 3.2-1 and 3.2-3 for flows into Pyramid Lake represent predicted conditions at Frenchman's Flat under the proposed project. However, since the maximum safe release from Pyramid Dam is 18,000 cfs, the discharges have been revised as presented in Table 3.2-8 for use in hydraulic and sediment analysis for the proposed project. These same discharges have been increased by a factor of 1.26 to account for increased watershed area and adopted for use as with-project discharges for the Bluepoint Campground area. Table 3.2-8 presents adopted peak discharges for the Frenchman's Flat and Bluepoint Campground areas under the proposed project.

Table 3.2-8 Piru Creek With-Project Hydrology

Flood Return Period, In Years	Maximum Average Daily Discharge, In cfs	
	At Frenchman's Flat	At Bluepoint Campground
100	18,000	22,680
50	18,000	22,680
20	15,400	19,404
10	7,770	9,790
5	3,370	4,246
2	658	829

Under the proposed project discharges at Frenchman's Flat up to about the 20-year flood would be approximately 1.5 to 2 times the without-project (or "No Project") discharges. Under the proposed project the 50-year discharge would be approximately the same as the without-project discharge, and the 100-year discharges, limited by the maximum safe outflow from the dam, would be approximately the same. However, the maximum safe discharge of 18,000 cfs is approximately a 60-year flood event under without-project conditions, but a 25-year flood event under the proposed project. This means that this discharge would occur with approximately twice the frequency under the proposed project as opposed to existing conditions without implementation of the proposed project. Bluepoint Campground discharges, which should be viewed as approximate, follow a similar pattern.

Exceptions to natural flows have included water deliveries to United, test flows, and the lag (typically one or two days) between inflow and outflow peaks at Pyramid Lake. Occasional water deliveries to United via middle Piru Creek have been up to 3,150 afy. Under with-project conditions these deliveries would be limited to between November 1st and the end of February of each water year. The water could be delivered over a few days to simulate a natural storm, or added to the discharge of an actual winter storm. Alternatively, delivery could be spread out over a 4-month period.

Spreading the United water deliveries evenly over the time between November 1st and the end of February would amount to a discharge of approximately 13 cfs. With-project average monthly discharges for November and December would be approximately 12 and 18 cfs, respectively, not counting the deliveries to United. The United discharges would therefore approximately double the average discharges for those months to approximately 25 to 31 cfs. As can be seen in Figures 3.2-2 and 3.2-3, flows of much greater magnitude than 25 to 31 cfs can occur in middle Piru Creek in the months of November and December. Further, the average monthly flow for those months can under natural conditions (simulated by the with-project conditions) be much higher than 25 to 31 cfs. With-project discharges for the months of January and February will average 150 to 260 cfs, which is well above the spread-out deliveries to United. Consequently, no adverse impact of spreading out the United deliveries over the allotted four-month period is anticipated.

Delivering all of the 3,150 acre feet of water to United in one or two days to simulate a natural storm could, depending upon release timing, result in a hydrograph with a peak flow rate of approximately 1,500 cfs to 3,000 cfs rising and abating in one or two days. This would be a relatively large simulated storm event similar in order of magnitude to the December 6, 1997 flood shown in Figure 3.2-3, but larger than any flood recorded for the year 1997 (Figure 3.2-2). Because a one to two-day release of 3,150 acre feet is an event that could normally occur in a simulated natural condition, no adverse effects are expected.

Estimated maximum test releases up to 50 cfs for 15 minutes would be avoided between March 15th and July 31st, but could occur at any time during the rest of the year. January to March simulated natural (with-project) flows would average well higher than 50 cfs, so the test releases are unlikely to be noticed during that time. Natural flows of 50 cfs or more are common during the months of October to

December, so it is unlikely these releases would cause an adverse impact during those months. Natural discharges of 50 cfs during the months of August and September are unusual, but could occur under natural conditions. Such a release would likely be noticed during those months, but no adverse hydrologic impact is anticipated.

Test discharges would be avoided between March 15th and July 31st, but emergency circumstances could arise where such releases are unavoidable. A review of stream records indicates that during the 1989 to 2002 water years there were 538 instances of average daily flow 50 cfs or higher entering Pyramid Lake between March 15th and July 31st. This averages to approximately 38 occurrences per year and would represent the with-project simulated natural flows. Most are in the months of March, April and May, although there were several occurrences of 50 cfs or more average daily flow extending into the middle part of July. Maximum average daily inflow during this period was 1,548 cfs on March 26, 1993. Inflow to Lake Piru during the same period has a similar pattern, with an average of 45 occurrences per year, also extending into the middle part of July. Maximum average daily flow for that period was 1,830 cfs on March 23, 1992. Emergency test releases of up to 50 cfs for 15 minutes are well within these natural discharges and would neither constitute an abnormal flow nor an adverse impact.

There would be a lag of approximately one or two days between inflows to Pyramid Lake and releases from Pyramid Lake. Since these flows would be released so quickly and in the same season after being generated, no adverse impact from this short lag time is anticipated except as relates to flood hazard as described in Impact H-7, below.

Hydraulics

Figures 3.2-15 and 3.2-16 show representative cross sections for the Frenchman's Flat and Bluepoint Campground areas, with water surface elevations shown for the proposed project. These figures can be compared with Figures 3.2-13 and 3.2-14 to assess the difference in the hydraulic conditions of middle Piru Creek with and without implementation of the proposed project. Frenchman's Flat Cross Section U5 (Figure 3.2-15) shows that under the proposed project a 2-year flow is contained entirely in the channel banks, but at a greater depth than under without-project conditions. Unlike existing conditions, a 5-year flow under the proposed project inundates the right overbank. The 10-year to 100-year floods inundate the right overbank terrace to increasing degrees and at greater depth than would occur under existing conditions. Bluepoint Campground Cross Section L3 (Figure 3.2-16) shows a similar inundation pattern as the without-project condition, but flow depths are greater.

Tables 3.2-9 and 3.2-10 summarize average hydraulic conditions for the Frenchman's Flat and Bluepoint Campground areas for various return period floods under the proposed project. There are substantial differences from the project's existing conditions, particularly in the Frenchman's Flat area and in the more frequent floods. All hydraulic parameters listed in the tables would increase, including flow depth (25 percent increase for 2 to 20-year floods) and flow velocity (20 percent increase for 2 to 20-year floods). Out-of-channel flow, as represented by left and right overbank flow width, would have the greatest increase in the Frenchman's Flat area (a 65 percent increase over existing conditions). Out of channel flow in the Bluepoint Campground area would increase by approximately 40 percent for the 2 to 20-year floods. The overall floodplain widths would increase by approximately 30 percent in the Frenchman's Flat area and by 20 percent in the Bluepoint Campground area.

Figure 3.2-15 Cross Section U5 With-Project Water Surface Elevations

Figure 3.2-16 Cross Section L3 With-Project Water Surface Elevations

Table 3.2-9 Average With/Without Project Hydraulic Conditions for Frenchman's Flat Area

Flow Return Period, in Years	Maximum Flow Depth, in Feet	Total Flow Topwidth, in Feet	Channel Flow Velocity, in Feet Per Second	Left Overbank Flow Width, in Feet	Left Overbank Flow Velocity, in Feet Per Second	Right Overbank Flow Width, in Feet	Right Overbank Flow Velocity, in Feet Per Second
Without Project (Existing Conditions)							
2	3.1	61	4.0	7	0.3	8	0.4
5	5.8	123	6.6	32	2.4	44	1.3
10	7.8	205	8.4	59	3.6	74	2.4
20	9.8	251	10.2	76	5.2	100	3.6
50	12.7	333	12.6	110	6.9	139	5.0
100	13.2	342	12.9	125	7.3	139	5.2
With Project Implementation							
2	3.8	71	4.7	8	1.0	12	0.6
5	7.2	190	7.9	58	3.0	65	2.1
10	9.7	249	10.1	86	5.1	99	3.5
20	12.5	329	12.4	114	6.7	138	4.9
50	13.2	342	12.9	125	7.3	139	5.2
100	13.2	342	12.9	125	7.3	139	5.2

Note: 18,000 cfs was used as the 100-year without project discharge, as well as the 50-year and 100-year with-project discharge.

Table 3.2-10 Average With/Without Project Hydraulic Conditions for Bluepoint Campground Area

Flow Return Period, in Years	Maximum Flow Depth, in Feet	Total Flow Topwidth, in Feet	Channel Flow Velocity, in Feet Per Second	Left Overbank Flow Width, in Feet	Left Overbank Flow Velocity, in Feet Per Second	Right Overbank Flow Width, in Feet	Right Overbank Flow Velocity, in Feet Per Second
Without Project (Existing Conditions)							
2	2.6	99	4.5	29	1.1	25	1.4
5	5.0	224	7.5	64	2.1	105	2.5
10	6.8	314	9.5	70	3.0	190	3.6
20	8.7	378	11.5	76	3.9	247	4.9
50	11.6	427	14.2	90	5.1	282	6.8
100	12.1	432	14.6	92	5.3	286	7.1
With Project Implementation							
2	3.2	125	5.2	41	1.4	40	1.9
5	6.2	293	8.9	68	2.8	170	3.3
10	8.6	376	11.4	76	3.8	246	4.8
20	11.3	425	13.9	90	5.0	281	6.6
50	12.1	432	14.6	92	5.3	286	7.1
100	12.1	432	14.6	92	5.3	286	7.1

Sediment Transport

As a result of higher flow velocities, depths, and widths, the sediment transport capacity of middle Piru Creek would be increased (Tables 3.2-11 and 3.2-12). Increases would be most substantial in the more frequent floods (2 to 20 year) for out-of-channel sediment transport and in the Frenchman's Flat area. In the Frenchman's Flat area, the overall capacity of the stream to move sediment (all flood return periods considered) would be increased by nearly 70 percent with implementation of the proposed project. Out-of-channel sediment transport capacity would be more than doubled overall, with the biggest increase occurring in the 5-year flood (an increase of nearly 6 times over existing conditions). There would be similar increases in sediment transport capacity at Bluepoint Campground, where overall sediment transport capacity would be increased by about 60 percent. Out-of-channel capacity would increase by about 75 percent, with 2 to 20-year out-of-channel capacity approximately doubling over the proposed project area's existing conditions.

Table 3.2-11 Piru Creek Sediment Transport Analysis Summary for the Proposed Project in the Frenchman's Flat Area

Flood Return Period, Years	Without Project (Existing Conditions) Averages				With Project Implementation Averages			
	Left Overbank Sediment Transport, cfs	Channel Sediment Transport, cfs	Right Overbank Sediment Transport, cfs	Total Sediment Transport, cfs	Left Overbank Sediment Transport, cfs	Channel Sediment Transport, cfs	Right Overbank Sediment Transport, cfs	Total Sediment Transport, cfs
2	0.0	3.0	0.0	3.0	0.0	4.8	0.0	4.9
5	0.3	13.3	0.9	14.6	4.1	22.0	2.9	28.9
10	5.6	26.0	4.4	36.0	12.3	40.3	13.0	65.6
20	12.8	41.1	12.1	65.9	27.3	64.1	31.2	122.7
50	29.2	66.5	29.6	125.2	32.8	71.0	39.2	142.9
100	32.8	71.0	39.2	142.9	32.8	71.0	39.2	142.9

Table 3.2-12 Piru Creek Sediment Transport Analysis Summary for the Proposed Project in the Bluepoint Campground Area

Flood Return Period, Years	Without Project (Existing Conditions)				With Project Implementation			
	Left Overbank Sediment Transport, cfs	Channel Sediment Transport, cfs	Right Overbank Sediment Transport, cfs	Total Sediment Transport, cfs	Left Overbank Sediment Transport, cfs	Channel Sediment Transport, cfs	Right Overbank Sediment Transport, cfs	Total Sediment Transport, cfs
2	0.8	2.5	0.1	3.4	1.3	4.0	0.4	5.7
5	4.6	10.2	3.5	18.3	8.6	15.8	8.4	32.8
10	10.7	18.6	12.0	41.4	19.0	29.1	28.6	76.6
20	19.5	29.7	29.7	78.9	35.2	47.2	67.1	149.5
50	37.2	49.1	71.7	158.0	40.9	52.6	79.9	173.4
100	40.9	52.6	79.9	173.4	40.9	52.6	79.9	173.4

Maximum moveable sediment sizes would increase in the with-project condition, particularly in the overbanks (Tables 3.2-13 and 3.2-14). At Frenchman's Flat, a 5-year flood would be capable of moving stones up to about 2.5 inches in diameter in the channel overbanks. Based on the sediment samples, material of this size or smaller comprises roughly 80 percent to 90 percent of the material in the overbanks, meaning that 80 percent to 90 percent of the material in the 5-year out-of-channel

floodplain has the potential to be moved by the flood. Bluepoint Campground out-of-channel discharges have the capacity to move larger rocks (1 to 2 inches in diameter for a 2-year flood and 3 to 4 inches in diameter for a 5-year flood). Based on the sediment samples, roughly 50 percent to 90 percent of the overbank material within the floodplain has the potential to be moved by 2 to 5-year floods in the Bluepoint Campground areas.

Table 3.2-13 Piru Creek Maximum Moveable Rock Size Summary at Frenchman's Flat for the Proposed Project

Flood Return Period, Years	Without Project Conditions (Existing Conditions)			With Project Implementation Conditions		
	Left Overbank	Channel	Right Overbank	Left Overbank	Channel	Right Overbank
	Particle Sizes in Inches					
2	0.0	2.8	0.0	0.1	3.5	0.2
5	1.1	6.0	1.3	2.7	7.7	2.5
10	3.3	8.5	3.1	5.0	11.2	5.2
20	5.1	11.4	5.3	7.2	15.2	7.5
50	7.4	15.5	7.9	7.8	16.2	8.4
100	7.8	16.2	8.4	7.8	16.2	8.4

Table 3.2-14 Piru Creek Maximum Moveable Rock Size Summary at Bluepoint Campground for the Proposed Project

Flood Return Period, Years	Without Project Conditions (Existing Conditions)			With Project Implementation Conditions		
	Left Overbank	Channel	Right Overbank	Left Overbank	Channel	Right Overbank
	Particle Sizes in Inches					
2	1.3	2.8	0.6	1.7	3.5	0.9
5	3.3	6.0	2.0	4.6	7.9	3.0
10	5.2	8.7	3.5	7.1	11.4	5.4
20	7.2	11.6	5.5	9.3	15.4	8.6
50	9.6	15.8	9.0	10.2	16.5	9.6
100	10.2	16.5	9.6	10.2	16.5	9.6

Analysis Summary

The results of the above analysis show that summer flows in middle Piru Creek would be much lower with implementation of the proposed project and at times would be non-existent at Bluepoint Campground. Winter flows would be higher and of longer duration. Winter flooding would be more frequent and more severe. Floodplains would be wider throughout middle Piru Creek, with deeper, swifter flows and more out-of-channel flooding. Sediment transport capacity would be substantially increased. This, coupled with the fact that Pyramid Lake traps sediment, would result in a substantial increase in the risk of bank erosion, particularly between Pyramid Dam and the Frenchman's Flat area, where flows would pick up sediment after leaving Pyramid Lake. Channel and overbank sediments would be disturbed and reworked by flooding more frequently and more extensively than under current conditions.

Impacts of the Proposed Project

The following impacts are based on the thresholds of significance presented above in Section 3.2.3.

Impact H-1: The proposed project could violate water quality standards or waste discharge requirements

The proposed project involves releasing natural stream flows from Pyramid Dam into middle Piru Creek at rates that simulate natural conditions. There would be no discharge of waste or use of pollutants that could violate water quality standards. Impact H-1 is therefore considered less than significant, and no mitigation is considered necessary.

Impact H-2: The proposed project could deplete groundwater supplies or interfere with groundwater recharge

The proposed project would not use groundwater. Local summer groundwater recharge in middle Piru Creek, particularly in the lower area in the vicinity of Bluepoint Campground, could be affected by the removal of the artificial summer flows. Since this area is not used for groundwater production, and the effect would be to return groundwater recharge to natural conditions, Impact H-2 is considered less than significant, and no mitigation is considered necessary.

Impact H-3: The proposed project could alter the existing drainage pattern in a manner which would result in erosion

Middle Piru Creek has a substantial potential for erosion under the current protocol for operation of Pyramid Dam, as is illustrated by the erosion that occurred adjacent to Old Highway 99 during the 1998 flood. However, simulation of a natural flow regime would increase winter flow peaks and frequency, resulting in increased capacity for sediment transport which, without a corresponding increase in sediment supply, would increase the capacity of the stream to erode the channel banks. This increased erosion potential would result in the reworking of sediments and creation of the sand bars that the arroyo toad requires. Higher, more flashy flow rates would likely lead to the more-frequent creation of in-stream pools that can serve as habitat for the arroyo toad. Erosion of the channel bed and overbank floodplain for the purpose of restoring arroyo toad habitat is one of the primary objectives of the proposed project and is not considered a significant impact.

The increased erosive potential could have adverse effects on infrastructure, particularly in the upstream area, in the vicinity of Frenchman's Flat and Old Highway 99. Old Highway 99 and the two Old Highway 99 bridges that cross middle Piru Creek downstream of Pyramid Lake could be affected. Old Highway 99 has a fiber optic line in the right of way, although the line is now on the opposite side of the highway from the area of direct impact.

The proposed project does allow for a reduction of storm water releases from Pyramid Dam if it appears that the full storm flow would endanger life, safety, or property downstream of the dam. This would require monitoring and an initial engineering analysis to estimate at what point flows may become significantly hazardous. Implementation of Mitigation Measure H-3 would reduce significant adverse impacts due to storm water releases to a level of less than significant.

Long-term stream degradation is an issue related to the erosive power of the stream. As described in Section 3.2.2, long-term degradation occurs as a result of the reduction in sediment supply. Since Pyramid Dam traps sediment, this is an ongoing situation that can eventually lead to channel armoring. The increase in sediment transport capacity as a result of the proposed project, without a corresponding increase in sediment supply, is expected to result in an increased rate of long-term degradation and to the long-term trend toward armoring of the streambed. Importation of sediment by truck to account for the deficit was investigated and determined to be impractical. The amount of sediment to be imported is difficult to estimate accurately, would fluctuate substantially from year to year, and would be very

large. An estimate based on the sediment transport rate of the stream in the Frenchman's Flat area indicates that approximately 100,000 to 250,000 cubic yards of sediment may have to be brought in annually to make up the deficit. This would require the use of approximately 10,000 truck trips per year, with corresponding environmental impacts, and it would be difficult to spread the sediment in a manner that would ensure proper and timely transport downstream. Since channel degradation is an ongoing process under the without-project condition, this component of Impact H-3 is considered adverse but not significant.

Mitigation Measure for Impact H-3

MM H-3 **Prevention of Erosion Damage to Infrastructure.** The CDWR shall perform an engineering analysis to determine the potential for expected releases to damage Old Highway 99, the Old Highway 99 bridges, utilities, and other infrastructure in or adjacent to the channel. The engineering analysis shall be used as a basis for establishing procedures and guidelines for monitoring erosion at infrastructure during flood releases. CDWR shall monitor erosion at key potential infrastructure damage areas during large flow releases and temporarily curtail releases should the monitoring determine the infrastructure to be at risk. CDWR shall subsequently install engineered erosion protection to prevent erosion damage to the areas determined to be at risk.

Impact H-4: The proposed project could create off-site siltation.

Sediment delivery to Lake Piru could be increased by approximately 60 percent through increases in winter flood peaks and volumes. According to the California Department of Boating and Waterways (2002), Lake Piru, completed in 1954, had an initial capacity of about 161,300,000 cubic yards. By 1996, the capacity of Lake Piru had been reduced to about 140,630,000 cubic yards. Based on this reduction in capacity, the average sedimentation rate for the lake from 1955 to 1996 was about 500,000 cubic yards per year. For the period from 1985 to 1996, however, the average sedimentation rate was only about 170,000 cubic yards per year. This reduction could have been caused, in part, by the presence of Pyramid Dam. Under the proposed project, average annual sediment delivery into the Lake Piru could be increased to 270,000 cubic yards per year or more (possibly as high as 500,000 cubic yards per year in the first years). Assuming a capacity of 140,630,000 cubic yards in 1996, and a constant sediment inflow rate of 170,000 cubic yards per year, Lake Piru would have an approximate life of 830 years under existing conditions. Under the proposed project, this lifespan could be reduced to 520 years at 270,000 cubic yards per year, and 281 years at 500,000 cubic yards per year. Given these long time periods, the increased sedimentation rate may not be sufficient to have an appreciable effect on the reasonably foreseeable operation of Lake Piru. Further, the rate of sediment delivery to Lake Piru after project implementation would be less than the rate of delivery prior to the construction of Pyramid Dam. Impact H-4 is therefore considered adverse but less than significant, and no mitigation measures are considered necessary.

Impact H-5: The proposed project could increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

Whereas the maximum safe release from Pyramid Dam would not change as a result of the proposed project, the frequency, extent and depth of floods up to that discharge, which relate to the rate of surface runoff, would be increased. Flooding would increase, but aside from the infrastructure described for Impact H-3, above, there are no structures within the proposed project area to be damaged. Impact H-5 is therefore considered adverse but less than significant, and no mitigation is considered necessary.

Impact H-6: The proposed project could create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems.

Middle Piru Creek is a natural stream and does not contain constructed stormwater drainage systems. The discharge pattern into Lake Piru would be changed to more water in the winter and less in the summer, but total flow delivery into the lake would not be significantly altered. Since Lake Piru was constructed 20 years prior to construction of Pyramid Dam, a return to a natural flow regime would be a return to the conditions that existed for many years before Pyramid Dam was built, and should not adversely affect Lake Piru or Santa Felicia Dam (which contains Lake Piru). No impact would be anticipated to occur and no mitigation measures are considered necessary.

Impact H-7: The proposed project could provide additional sources of polluted runoff or otherwise degrade water quality.

The proposed project involves no construction and no operation that would be a source of pollution. Aside from the increased load of naturally occurring sediment in winter storms, the proposed project would not contribute to water quality degradation. Impact H-7 is therefore considered less than significant, and no mitigation measures are considered necessary.

Impact H-8: The proposed project could expose people or structures to a risk of loss, injury or death involving flooding, including flooding as a result of the failure of a dam.

Under the proposed project winter flows into Pyramid Lake, up to the maximum safe release from the Dam (18,000 cfs), would be released as they occur to the extent feasible and consistent with safety considerations. Releasing discharges as they occur, without attenuation, would result in higher and more frequent flow discharges than occurs under the current condition. As a result, the flood hazard to people along the stream, particularly hikers, recreational users at Frenchman's Flat and Bluepoint Campground, and the users of a cabin located west of Piru Creek at approximately creek mile 16.5 (Figure 2-3), would be increased.

Based on hydraulic data for Cross Section U-2 (Figure 3.2-11), and hazard relationships described in Figures 5 and 6 of the Bureau of Reclamations "Downstream Hazard Classification Guidelines" (USBR, 1988), it was estimated that a discharge of 50 cfs or greater would be a high hazard flow for children, and 200 cfs or greater would be a high hazard flow for adults. High hazard means that almost any size child or adult would be in danger of floodwater. Cross Section U-2 is chosen as representative of the high recreational use Frenchman's Flat area. Based on recorded average daily discharges from 1988 to 2002, with Pyramid Lake outflow representing without-project conditions, the average yearly without-project high hazard days were 57 for children and 11 for adults. For with-project conditions, as represented by inflow to Pyramid Lake for the same period, high hazard flow days averaged 66 for children and 27 for adults per year. This represents approximately a 16 percent increase in hazard for children, and 145 percent increase for adults. Further, there would be a lag of approximately one or two days between Pyramid Lake inflows and releases. It is possible that during that period of time weather conditions could change such that the risk of flooding as perceived by the public would be reduced, resulting in a reduced awareness of the flood hazard by recreational users of the area.

A cabin located west of Piru Creek at approximately creek mile 16.5 is outside the floodplain and would not be affected by the proposed project. Access to this cabin is by an unpaved and little-maintained road which crosses middle Piru Creek at grade at two locations. According to the U.S. Bureau of Reclamation (USBR, 1988), safe access through flowing water by vehicles depends on flow depth and velocity. Using Bluepoint Cross Section L3, it was determined that a discharge of 450 cfs

would result in flows with depth and velocity characteristics that would be defined by the U.S. Bureau of Reclamation as "high danger" flows, meaning that occupants of almost any size passenger vehicle are in danger from flood water. Based on streamflow records from after construction of Pyramid Dam, average daily flows of 450 cfs or higher are reached at Bluepoint Campground approximately 4 days per year. Under the proposed project and based on streamflow records from prior to construction of Pyramid Dam, an average daily discharge of 450 cfs would be reached approximately 8 days per year. The additional four days loss of safe access represents a significant adverse impact per the safe access criteria specified by the U.S. Bureau of Reclamation. People in vehicles trying to cross under hazardous flow conditions would be at severe personal risk. Hikers on recreational trails that cross or parallel the creek would also be at risk. Mitigation Measure H-8 requires development of a flood warning system to reduce the potential for personal risk from flooding. It is the opinion of the CDWR that this mitigation measure reduces Impact H-8 to less than significant.

Mitigation Measure for Impact H-8

MM H-8 Development of flood warning system. The CDWR shall work with the USFS and landowners to develop a warning system and place signage warning the public of dangerously high flows in middle Piru Creek.

Due to the proposed project area's location, the proposed project would not be subject to or induce inundation by seiche, tsunami, or mudflow. These potential impacts therefore do not apply to the proposed project.

3.3 CULTURAL AND PALEONTOLOGICAL RESOURCES

3.3.1 Introduction

As described in Section 2.1, middle Piru Creek is approximately 18 miles long and is located immediately south of Pyramid Lake and north of Lake Piru. To evaluate the proposed project area with respect to cultural and paleontological resources, a pedestrian survey of the proposed project area was conducted in the spring of 2004. This survey included visual inspection of the creek corridor and the various small drainages feeding the creek. The proposed project area was surveyed from the creek bed to an elevation of 1,250 feet above mean sea level at the northern end of Lake Piru and to an elevation of 2,250 feet above mean sea level at the base of Pyramid Dam. The change in elevation (1,000 feet from north to south) equated to an average of 50 feet above the existing streambed. Depending on the surrounding terrain, the survey area varied from very narrow alignments (e.g., the Piru Gorge) to wider, more accessible areas (e.g., the expanse at Canton Canyon above Lake Piru).

To assess the potential impacts of the proposed project on archaeological and paleontological resources the following tasks were completed:

- **Archaeological Records Check:** A standard archaeological records check was completed through the California State University, Fullerton, South Central Coastal Information Center (CSUF-SCCIC). The CSUF-SCCIC houses documentation from archaeological studies in Los Angeles, Ventura, and Orange Counties. Records for the proposed project area and a one-mile radius surrounding the proposed project area were investigated. Results of this level of research were used to place the proposed project area within a context for initial evaluation and sensitivity for cultural resources.
- **Limited Historic Background Research:** Historic background research was limited to a general history of the proposed project area and its association with historic ranchos, ranches, or historic events in the middle Piru Creek area of Los Angeles and Ventura Counties. Research was conducted at the CSUF-SCCIC; the

historic map library at the University of California, Riverside; perusal of data on file at the Bureau of Land Management, California Desert District, Riverside; and the McKenna et al. in-house library.

- **Native American Consultation:** McKenna et al. contacted the Native American Heritage Commission and inquired into the presence or absence of religious or sacred sites in the proposed project area. McKenna et al. received a listing of Native American representatives for Los Angeles and Ventura Counties (Appendix B) and used this listing to inquire into any areas of concern for prehistoric or Native American resources. Results of these communications have been incorporated into this analysis.
- **Paleontological Overview:** A paleontological overview of the proposed project area was completed by consulting with Dr. Samuel McLeod of the Natural History Museum of Los Angeles County, Vertebrate Paleontological Section. Additional research was completed through compilation of paleontological overviews completed for nearby areas (e.g., Castaic, Gorman, etc.). All data have been incorporated into this analysis.
- **Field Survey:** An intensive field survey of the proposed project area was completed by two qualified archaeological surveyors between April 11 and 28, 2004. The field survey was supplemented by a photographic record and field notes. All pertinent data of the survey have been incorporated into this analysis.
- **Analysis:** All data compiled over the course of this investigation were reviewed and are summarized in the following section. Additionally, a technical report in a format requested by the State Office of Historic Preservation and the CSUF-SCCIC has also been prepared for CDWR.

3.3.2 Environmental Setting

Brief Cultural History

Singer et al. (1993) provided the following summary of the cultural history of the project region, including the middle Piru Creek area. He notes that this area is associated with the Tataviam of northern Los Angeles County and eastern Ventura County. No major changes to the region have occurred since Singer's interpretations.

> "The project area is located at the … border of territory historically occupied by the Tataviam (Johnson and Earle 1990, King and Blackburn 1978) … Current information on the enigmatic Tataviam comes primarily from the ethnographic research of A.L. Kroeber and the largely unpublished notes of John P. Harrington, who collected limited data from consultants of Kitanemuk, Yokuts, Tubatulabal, and Serrano descent during the early part of the 20th Century, and from recent archaeological work in the area. The Kitanemuk, a related people who lived in the Antelope Valley, provided Harrington with most of his information, as the Tataviam people had virtually disappeared as a distinct ethnic group by the turn of the century. Harrington had several Kitanemuk consultants at Tejon Ranch who provided important ethnogeographic information during "placename trips" that Harrington conducted. The term "Tataviam" is actually a Kitanemuk word which roughly translates as 'the people who live in the light of the morning sun'. The name is also thought to refer to people whose villages were located on south or east facing slopes.
>
> The Tataviam were a Takic speaking population who were allied linguistically with other Takic speakers of the Uto-Aztecan linguistic stock such as the Kitanemuk, Serrano, and Gabrielino (King and Blackburn, 1978). Archaeological data suggest that the Tataviam began to differentiate from other Takic speakers around 1000 B.C. By historic times the Tataviam language was so distinct that one of Harrington's Kitanemuk consultants remarked that it was as foreign to hum as English. Most of this linguistical information comes from Kitanemuk sources, and it is interesting to note that only eleven works and phrases in the Tataviam language have ever been published (Johnson and Earle, 1990).

Johnson and Earle (1990) have recently analyzed the Harrington data and other sources of information regarding the Tataviam to reconstruct the geographical extent of their territory. According to Johnson and Earle (1990), "the territory of the Tataviam has been identified as north of the Los Angeles metropolitan area, it partially overlaps the western part of the Angeles National Forest and includes the northwest portion of Los Angeles County as well as part of Ventura County." The core of this area, and of the Tataviam territory itself, is the upper Santa Clara River drainage area, specifically the south facing slopes of the Liebre and Sawmill Mountains. According to one of Harrington's Kitanemuk consultants, one historic Tataviam rancheria, called haw'tahovea, was located near present day Quail Lake, about 3.5 miles southeast of the project area (ibid.).

Generally speaking the Tataviam, like their neighbors, followed an annual cycle of trapping, hunting, and harvesting of native plants and animals. Populations consisting of several related families, or larger kin groups, lived in permanent villages. Based on archaeological and ethnographic data, settlements varied from large villages of about 200 people to small communities with only 10 to 25 people or less. Aboriginal society began to collapse soon after the introduction of European diseases immediately after contact and colonization in 1769. Native societies disintegrated in large part due to epidemic diseases with high mortality rates, and the exacerbating effects of Spanish colonial practices. As reflected in the following excerpt:

> 'By 1810, virtually all of the Tataviam had been baptized at San Fernando Mission. By the time secularization occurred in 1834, the descendants of most missionized Tataviam had married members of the other groups, either at the mission or in the Tejon region. By 1916 the last speaker of the Tataviam language was dead, and any real opportunity for collecting firsthand information on this obscure group had vanished forever.' (King and Blackburn, 1978).

Colonial Spanish, Mexican and Anglo-American historical records and documents on the area are relatively abundant (for a concise summary on the history of the Hungry Valley area refer to Kelly, Hines and Luberski. 1980). The nearby Santa Clartia Valley was along the route of the first land based expedition to traverse the region in 1769 by Gaspar de Portolá. Another expedition, led by a Spanish missionary, Friar Francisco Garces, followed the approximate route of I-5 to Castaic Lake, near the project area. Garces considered the Indian women he encountered here to be "cleaner and neater than any he had seen from the same nation" (Kelly, Hines and Luberski, 1980). On September 8, 1797 the Mission was established at San Fernando, soon after, in 1804, the Assistancia [sic] de San Francisco was set up in the Castaic Junction area and local Tataviam were probably recruited for agricultural and construction work. The next notable Spanish expeditions were those of Father Jose Marcia de Zalvidea and Alferez Gabriel Moraga in 1806, both of whom traveled through the Tejon Pass region.

The first non-native use of the study area was after Mexico gained independence from Spain in the 1830s. The Mexican Land Grant of Rancho de Los Alamos y Aqua Caliente to Pedro C. Carrillo under Mexican Governor Micheltorena was made in 1843. However, apparently Carrillo did not occupy the land and the claim was re-granted to Francisco Lopez, Vicinte Botiller, and Luis Johnson in 1846; unsuccessful attempts to homestead the land led to its sale in 1852 to Augustin Olvera of Los Angeles. During this time period the area was probably used for cattle grazing and for mining. Gold was discovered by Francisco Lopez in 1842 near the watershed of Piru Creek and many people believed that the legendary "Los Padres Silver Mines" were located somewhere in the Hungry Valley area. The rugged and steep mountain passes were just one reason settlement came slowly to the region in the mid 1850s. Writers in

this time who traveled through the area noted that "the country through which we are able to pass is infested with California and Mexican outlaws, whose trade is robbery, and who will often shoot down a traveler for the sake of the horse on which he is mounted" (ibid.). The region was also feared because it was still the range of the dangerous grizzly bear.

The first American settlements came after the Homestead Act of 1862. The Gorman family, two brothers, James and Henry, and their widowed mother, owned a saloon and a store in present day Gorman. Gorman's mail station was established in 1877, as well as the family's blacksmith shop and ranch. The Gorman property was sold to Oscar Newell Ralphs in 1899. According to Kelly, Hines and Luberski (1980):

> 'The Ralphs family first came to Los Angeles from Salt Lake City, Utah with the teamsters. In Los Angeles, the Ralphs brothers, Walter and Albert, were registered as merchants who operated a grocery and provision store on south Spring Street called "Ralphs Brothers". Oscar N. Ralphs, who worked as a clerk for his brothers, soon quit and tried to mine in Arizona. After an un-successful attempt he moved to Gorman, an area he knew well from previous hunting trips. Knowing the needs of miners and prospectors, Ralphs began to supply the Stauffer Borate Mines near Frazier Park with beef and pro-visions. Most of the mines in the surrounding area were closed by 1913, but there had been enough business in the area for the family to prosper. After his death in 1922, his widow Mary McKinzie Ralphs and children took over the several family trades, including cattle ranching in Hungry Valley and Gorman.' (Ibid.).

Today, descendants of the Ralphs family still live and maintain land holdings as well as a motel and restaurant in the Gorman area (approximately eight miles north of Pyramid Lake)."

Other references to the history of the study area are contained in Gudde (1969):

- Gorman. The post office, Gorman's Station, was established December 18, 1877, and reestablished as Gorman on September 29, 1915. It was named for H. Gorman, the first postmaster.
- Piru, River, Creek, Canyon, town. According to Kroeber, the name is derived from Shoshonean pi'idhu-ku, the name of a plant. A place called Piru is mentioned on May 31, 1827 and with various spellings in the following years: the Arroyo de Piruc is shown on the "ta diseno" (the historic Spanish-Mexican rancho map) of the San Francisco grant, 1838. In American times, the name appears as Piru in the Statutes of 1850 and as Rio Piru on the Parke-Custer map of 1854-1855. The town was laid out in 1888 and called Piru City after the Piru ranch developed by the Chicago publisher David C. Cook.

In addition to the information presented above, it is noted that State Highway 99 (Old Highway 99) is also associated with the proposed project area. Old Highway 99, the predecessor to present-day I-5, dates to 1933. This roadway, a portion of which is now under the water of Pyramid Lake, runs near the middle Piru Creek streambed from just below Pyramid Dam to Frenchman's Flat Campground where it deviates to the east. The remaining portions of Old Highway 99 are well above the creek bed and would not be impacted by the increased winter flows. Although some erosion has occurred along Old Highway 99, erosion repairs are being addressed as part of a separate project (see Table 7-1). Additionally, Mitigation Measure H-3 (Section 3.2.4) has been proposed as part of the proposed project to minimize erosion-related impacts. Implementation of Mitigation Measure H-3 and completion of the separate project referenced above should prevent any further significant damage to Old Highway 99.

In the immediate vicinity of the southern portion of the proposed project area, two homesteads have been identified: the Dunton homestead of 1899; and the Whitaker homestead of 1896. The Dunton homestead is sufficiently outside the proposed project area and would not be impacted by the proposed

project. The Whitaker homestead (Whitaker Ranch) is identified on the Cobblestone Mountain Quadrangle as being adjacent to middle Piru Creek and accessed by a dirt road leading from the Blue Point Campground to Kester Camp.

Previous Research

Research into previous studies was completed at the CSFU-SCCIC. This research supplemented earlier research conducted by McKenna et al. in 1992. Research was conducted on November 11 and 17, 2003. This search included a review of all recorded historic and prehistoric archaeological sites within a one-mile radius of the proposed project area as well as a review of all known cultural resource reports. In addition, the file of historic maps, the California Points of Historical Interest (PHI), the listing of California Historical Landmarks (CHL), and the California Register of Historic Resources Inventory (HRI) were checked for the proposed project. For ease of reference, the research presented below is based on USGS 7.5' quadrangle maps. The proposed project area is located in the following USGS 7.5' quadrangles:

USGS Quadrangle	Township	Range	Section(s)
Black Mountain	6N	18W	2
Liebre Mountain	6N	18W	2, 11
Whitaker Peak	6N	18W	12, 13, 14
Cobblestone Mountain	6N	18W	14-16, 21-22, 27, 34
	5N	18W	3, 4, 10, 15

Black Mountain Quadrangle

Twelve studies (LA438, LA486*, LA848, LA1186, LA1354, LA2429, LA2600*, LA3289*, LA3701, LA3796, LA4107 and LA4223) have been conducted within a one-mile radius of the proposed project area. Of these, three are located in the proposed project area.

These studies have identified three archaeological sites (19-000392, 19-000393 and 19-000438) within a one-mile radius of the proposed project area. None of these sites, however, are located directly within the proposed project area's study boundaries. Further, no prehistoric isolates have been identified within a one-mile radius of the proposed project area.

No historic archaeological sites have been identified within a one-mile radius of the proposed project area. Likewise, no historic isolates have been identified within a one-mile radius of the proposed project area. No built environments (historic resources) have been identified within a one-mile radius of the proposed project area. As a result, no California Point of Historical Interest, California Historical Landmarks, California Register of Historic Places properties, National Register of Historic Places properties or California Historic Resources Inventory properties that have been identified are within a one-mile radius of the proposed project area.

Liebre Mountain Quadrangle

Six studies (LA2223, LA2429, LA2600*, LA3289, LA3894 and LA4107) have been conducted within a one-mile radius of the proposed project area. Of these, one includes a portion of the proposed project area. As a result of these studies, two recorded prehistoric archaeological sites (19-000077 and 19-001008) have been identified within a one-mile radius of the proposed project area, neither of which is

* Indicates that the referenced study is within the project area.

located directly in the proposed project area. No prehistoric isolates have been identified within a one-mile radius of the proposed project area.

No historic archaeological sites have been identified within a one-mile radius of the proposed project area. No historic isolates have been identified within a one-mile radius of the proposed project area. No built environments (historic resources) have been identified within a one-mile radius of the proposed project area. As a result, no California Point of Historical Interest, California Historical Landmarks, California Register of Historic Places properties, National Register of Historic Places properties, or California Historic Resources Inventory properties that have been identified are within a one-mile radius of the proposed project area.

Whitaker Peak Quadrangle

Five studies (LA1884, LA2600*, LA3289, LA3796 and LA4107) have been conducted within a one-mile radius of the proposed project area. Of these, one is located in the proposed project area. No recorded prehistoric archaeological sites have been identified within a one-mile radius of the proposed project area. No prehistoric isolates have been identified within a one-mile radius of the proposed project area.

No historic archaeological sites have been identified within a one-mile radius of the proposed project area. No historic isolates have been identified within a one-mile radius of the proposed project area. No built environments (historic resources) have been identified within a one-mile radius of the proposed project area. As a result, no California Point of Historical Interest, California Historical Landmarks, California Register of Historic Places properties, National Register of Historic Places properties, or California Historic Resources Inventory properties that have been identified are within a one-mile radius of the proposed project area.

Cobblestone Mountain Quadrangle

Eight studies (VN25*, VN839, VN1124*, VN1435*, VN1598*, VN1844*, VN2163* and LA2600*) have been conducted within a one-mile radius of the proposed project area. Of these, seven involved portions of the proposed project area. All eight involved areas outside of the proposed project area. As a result of these eight studies, two prehistoric archaeological sites (56-000232 and 56-100152) have been identified within a one-mile radius of the proposed project area. However, neither site is within the proposed project area and neither would be impacted by the proposed project. No prehistoric isolates have been identified within a one-mile radius of the proposed project area.

Two historic archaeological sites (56-001562 and 56-001625) have been identified within a one-mile radius of the proposed project area, but no historic isolates have been identified. One multi-component (prehistoric and historic) archaeological site (56-001621) has also been identified within a one-mile radius of the proposed project area.

Despite these findings, no California Point of Historical Interest, California Historical Land-marks, California Register of Historic Places properties, National Register of Historic Places properties, or California Historic Resources Inventory properties that have been identified are within a one-mile radius of the proposed project area.

* Indicates that the referenced study is within the project area.

Summary of Previous Research

The research into previously recorded resources shows that most of the proposed project area is clear of any cultural resources. The recorded resources were identified at the southernmost portion of the proposed project area, near Lake Piru. At this location only the Whitaker Ranch (homestead) may be impacted by the increased winter water flows associated with the proposed project as discussed below in Section 3.3.4. Whitaker Ranch is located on middle Piru Creek, north of Bluepoint Campground.

3.3.3 Applicable Regulations and Significance Criteria

The criteria for a significant resource under the Guidelines for the California Environmental Quality Act, as amended, read:

Section 15064.5. Determining the Significance of Impacts to Archeological and Historical Resources.

a. For purposes of this section, the term "historical resources" shall include the following:

   1. Resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code §5024.1, Title 14 CCR, Section 4850 et seq.).

   2. A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

   3. Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code §5024.1, Title 14 CCR, Section 4852) including the following:

      A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

      B. Is associated with the lives of persons important in our past;

      C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

      D. Has yielded, or may be likely to yield, information important in prehistory or history.

   4. The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1[k] of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1[g] of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

b. A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

   1. Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

   2. The significance of an historical resource is materially impaired when a project:

      A. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historic resources; or

      B. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

      C. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Re-sources as determined by a lead agency for purposes of CEQA.

   3. Generally, a project that follows the Secretary of the Interior¹s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior¹s Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource.

   4. A lead agency shall identify potentially feasible measures to mitigate significant adverse changes in the significance of an historical resource. The lead agency shall ensure that any adopted measures to mitigate or avoid significant adverse changes are fully enforceable through permit conditions, agreements, or other measures.

   5. When a project will affect State owned historical resources, as described in Public Resources Code Section 5024, and the lead agency is a State agency, the lead agency shall consult with the State Historic Preservation Officer as provided in Public Resources Code Section 5024.5. Consultation should be coordinated in a timely fashion with the preparation of environmental documents.

c. CEQA applies to effects on archaeological sites.

   1. When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource, as defined in subsection (a).

   2. If a lead agency determines that the archaeological site is an historical resource, it shall refer to the provisions of Section 21084.1 of the Public Resources Code, and this section, Section 15126.4 of the Guidelines, and the limits contained in Section 21083.2 of the Public Resources Code do not apply.

   3. If an archaeological site does not meet the criteria defined in subsection (a), but does meet the definition of a unique archeological resource in Section 21083.2 of the Public Resources Code, the site shall be treated in accordance with the provisions of section 21083.2. The time and cost

limitations described in Public Resources Code Section 21083.2 (c-f) do not apply to surveys and site evaluation activities intended to determine whether the project location contains unique archaeological resources.

4. If an archaeological resource is neither a unique archaeological nor an historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the re-source and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

d. When an initial study identifies the existence of, or the probable likelihood, of Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code §5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by the Native American Heritage Commission. Action implementing such an agreement is exempt from:

   1. The general prohibition on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (Health and Safety Code Section 7050.5).

   2. The requirements of CEQA and the Coastal Act.

e. In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

   1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

      A. The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and

      B. If the coroner determines the remains to be Native American:

         1. The coroner shall contact the Native American Heritage Commission within 24 hours.

         2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.

         3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or

   2. Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further sub-surface disturbance.

      A. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.

      B. The descendant identified fails to make a recommendation; or

      C. The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

f. As part of the objectives, criteria, and procedures required by Section 21082 of the Public Resources Code, a lead agency should make provisions for historical or unique archaeological resources accidentally discovered during construction. These provisions should include an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place.

No other regulations are applicable to this analysis.

3.3.4 Environmental Impacts and Mitigation Measures

Impact C-1: The proposed project could adversely affect prehistoric or historic resources in the project area

As a result of the investigations summarized in Section 3.3.1, above, no new evidence of prehistoric or historic resources in the proposed project area has been found. The proposed project area was intensively (visually) surveyed by two qualified archaeological surveyors. No apparent surface evidence of prehistoric remains within the proposed project area has been identified.

No historic archaeological sites were found within the proposed project area although there is a potential for historic resources in the immediate vicinity of the Whitaker Ranch property. The Whitaker Ranch property is west of the projected impact boundary of the proposed project area. Historically a road leading to the property fell within the proposed project's boundaries and is mapped as such on the current USGS quadrangles. However, at the time of this investigation's survey no evidence of the road was found; flooding in the area that has occurred over the past few decades has washed away all indications of the old road. Similarly, the road from Blue Point Campground to Kester's Camp was at one time located in the sandy bottom of the creek bed. However, no physical evidence of this road was identified during the survey either. This road was obliterated by earlier high flows in the creek. No standing structures were reported for the area of Whitaker Ranch that fall in the boundaries of the predicted water surface elevations that would result from the proposed project's maximum stream release of 18,000 cfs. Therefore, no structural components associated with the ranch would be anticipated to be directly impacted by the peak (18,000 cfs) discharges of the proposed project. There is the potential for previously unidentified components of Whitaker Ranch located adjacent to the property to be uncovered due to increased flows and erosion. However, the uncovering of such resources would not be the result of direct human-induced disturbance(s). Additionally the potential uncovering of these resources is what would be anticipated to occur under pre-dam conditions. Although the rate of the uncovering of these resources due to the increased rate of erosion associated with the proposed project may occur, this rate change would not be considered a potentially significant adverse impact in itself. Testing of the dam's radial gates, continued water deliveries to United, and the estimated one to two day lag time between recorded inflow to Pyramid Lake and outflow to middle Piru Creek would fall within the parameters of the creek's natural hydrology, as described in Section 3.2.4, and would not be anticipated to result in any significant adverse impacts to cultural resources. Impacts are therefore considered adverse but less than significant, and no mitigation measures are recommended.

Impact C-2: The proposed project could adversely affect paleontological resources in the project area

The proposed project area is considered sensitive for paleontological resources. This is especially true for the northern portion of the proposed project area. Such resources have been previously identified in the area of Pyramid Lake (the Piru Gorge area [creek mile 1]), and other specimens are likely to be present. As reviewed in Section 3.2.4 (water resources impacts associated with the proposed project), the proposed project would result in an increase in the potential for erosion of the channel bed, overbank floodplain, and channel banks. This increased erosion potential would be greatest in the vicinity of Frenchman's Flat and Old Highway 99, where substantial bank erosion has already occurred as the result of the 1998 flood. Implementation of the proposed project would, to the extent operationally possible, revert the overall hydrology and erosion potential of middle Piru Creek back to its natural state. Winter storm releases of the dam would simulate the volume and velocities of flows, and therefore the degree of erosion, that would occur naturally; the artificially low rate of erosion created by current operations of the dam would be discontinued. The potential exposure rate of fossil (paleontological) resources due to erosion would thus increase as a result of the proposed project. However, a change in the rate of fossil exposure would not be considered a significant adverse impact in itself, and potential physical impacts to such resources would not be caused by direct human disturbance(s). In addition, proposed water deliveries to United, the testing of Pyramid Dam's radial gates, and the estimated lag time between recorded inflow to Pyramid Lake and outflow to middle Piru Creek would not be anticipated to significantly impact paleontological resources as these activities would not substantially effect the overall natural hydrology of the creek (Section 3.2.4). Therefore, impacts would be considered adverse but less than significant, and no mitigation is recommended.

3.4 RECREATION

3.4.1 Introduction

Situated in the Angeles and Los Padres National Forests, the proposed project area is heavily used and valued by anglers, campers, kayakers, and other recreational users. This analysis examines how the proposed project could potentially affect the use of recreational areas and how recreation for different users would be altered by the proposed project, both adversely and beneficially.

3.4.2 Environmental Setting

Recreational Facilities and Uses

The proposed project would be located on lands administered by the Angeles and Los Padres National Forests. The Angeles National Forest encompasses over 650,000 acres of land; the Los Padres National Forest includes approximately 1.75 million acres of land. Both Forests are easily accessible from the Los Angeles metropolitan area as well as Ventura, Los Angeles, Orange, Santa Barbara, Kern, and San Bernardino Counties. Recreational opportunities in the Forests include camping, picnicking, fishing, hunting, target shooting, off-highway vehicle recreation, water sports, wilderness use, winter sports, hiking, and equestrian use (CDWR, 2003). Portions of the Angeles National Forest typically close during the summer and fall due to wildfires or fire hazard. During the past three years, Piru Creek has been closed anywhere from three to six weeks during the fire season due to fire hazards (USFS, 2004c). Recreational facilities located within a few miles of the proposed project area are listed in Table 3.4-1.

Table 3.4-1 Recreational Facilities in the Project Area

Recreational Area	Description	Facilities Offered	Distance From Proposed Project
Angeles National Forest	The Angeles National Forest was established in December 1892. The Forest includes four Ranger Districts and portions of Ventura, Los Angeles, and San Bernardino Counties. It covers over 650,000 acres and ranges in elevation from 1,200 to 10,064 feet.	Camping, hiking, fishing, and other recreational opportunities.	The proposed project area is located within Forest boundaries.
Los Padres National Forest	Los Padres National Forest encompasses nearly two million acres in the coastal mountains of central California. The Forest stretches across almost 220 miles from the Big Sur Coast in Monterey County to western Los Angeles County.	Camping, hiking, fishing, and other recreational opportunities.	The proposed project area is located within Forest boundaries.
Pyramid Lake	Pyramid Lake was completed in 1973. It is located in both Angeles and Los Padres National Forests but falls under the administration of the Angeles National Forest. It has 21 miles of shoreline and 1,297 acres of surface area. The lake is a reservoir for the State Water Project.	Camping, fishing, boating, swimming, and other recreational opportunities.	Pyramid Lake is located immediately upstream of the proposed project area.
Lake Piru	Lake Piru was completed in 1955 and is located in the Angeles and Los Padres National Forests. The lake has an area of approximately 1,200 surface acres and is about 1 mile wide by 4.1 miles long. The lake is a reservoir owned and operated by United Water Conservation District.	Camping, fishing, boating, swimming, and other recreational opportunities.	Lake Piru is located immediately downstream of the proposed project area.
Hungry Valley State Vehicular Recreation Area	The Hungry Valley State Vehicular Recreation Area is the second largest off-road vehicular recreation area in California. It includes 19,000 acres of grasslands, coastal sage scrub and oak woodland.	130 miles of trails for off-highway vehicles in addition to facilities for hikers and mountain bikers.	The area is located approximately 6 miles northwest of the proposed project area.
Sespe Condor Sanctuary	The Sespe Condor Sanctuary was established in 1947 by USFS. It encompasses 53,000 acres within the Los Padres National Forest.	Camping, hiking, and other recreational opportunities.	The sanctuary is located approximately 6 miles southwest of the proposed project area.
Sespe Creek and Sespe Wilderness Area	Congress designated over 31 miles of Upper Sespe Creek as a National Wild and Scenic River and 219,700 acres in Los Padres National Forest as the Sespe Wilderness Area in 1992 by Congress.	Hiking, angling, picnicking, rock climbing, and other recreational opportunities.	Sespe Creek is located approximately 7 miles west of the proposed project area. Milepost 4 through 16 of the proposed project area are within the Sespe Wilderness Area
Castaic Lake Recreation Area	The Castaic Lake Recreation Area includes 8,800 acres of land and includes 29 miles of shoreline. It serves as a reservoir for the State Water Project.	Camping, fishing, boating, swimming, hiking, and other recreational opportunities.	Castaic Lake is located approximately 5 miles southeast of the proposed project area.
Castaic Potential Wilderness Area	The Castaic Potential Wilderness area includes approximately 63,651 acres within Angeles National Forest. This wilderness has been proposed for designation as a Wilderness Area.	Camping, hiking, and other recreational opportunities.	Castaic Potential Wilderness is approximately 2 miles east of the proposed project area.

Sources: Lake Piru, 1998; CDWR, 2000; CDWR, 2003; Friends of the River, 2003; California Wilderness Coalition, 2004

Recreational activities along middle Piru Creek include camping, picnicking, hiking, fishing, rafting, kayaking, and water play. Piru Creek is designated as a Study River under the National Wild and Scenic River System and the 2.75 miles of middle Piru Creek from 0.25 mile downstream of Pyramid Dam to Osito Canyon is designated as a Recreational River by the California Wild Heritage Act of 2002, Section 201 Designation of Wild and Scenic Rivers (Friends of the River, 2003). A National Forest Adventure Pass is required for admission to Frenchman's Flat in middle Piru Creek. An Adventure Pass costs $5 per car per day, or $30 per car annually. An annual Adventure Pass for a secondary family vehicle can also be purchased for an additional $5. Passes are enforced throughout the year, and are aggressively enforced during holiday weekends. Camping is allowed at Frenchman's Flat, located at creek mile 3 (Figure 2-2). From the parking area at Frenchman's Flat up to the Pyramid Dam Bridge, Old Highway 99 is open to public access by walking or bicycling but is closed to vehicular traffic (CDWR, 2003). Lands upstream of the Pyramid Dam Bridge to Pyramid Dam are closed to the public. Lands downstream of Frenchman's Flat are accessible by foot, but there are no maintained trails from approximately creek mile 4 downstream to creek mile 16 (Figures 2-2 and 2-3). South of creek mile 16, maintained trails begin again north of Kester Camp and run south through Whitaker Ranch (located at approximately creek mile 17 in Figure 2-3) to Blue Point Recreation Area (located between creek miles 17 and 18 in Figure 2-3), which is temporarily closed to camping (USFS, 2004a). Although Blue Point is closed, a paved road from this area leads southward down to and along the west side of Lake Piru.

The most frequented portion of middle Piru Creek is the Frenchman's Flat area, which sometimes receives more than a thousand visitors in a single weekend (CDWR, 2004a). The area is a popular location for picnics, swimming, day-use, camping, and fishing. Rafters and kayakers also occasionally use the area during times of high water flow in the creek. On weekdays the area is subject to regular use by lunchtime picnickers, hikers, anglers, and day users. Live music and independent food vendors are not uncommon during periods of heavy recreational use. Some concerns have been raised by area users regarding gang and firearm activity and tagging (spray-painting on rocks and structures) during high use periods. Altercations have also been reported between anglers and swimmers. Weekday users commonly complain about the litter and refuse left behind by the weekend crowds (CDWR, 2004a). Although fishing occurs in other areas along middle Piru Creek other than the Frenchman's Flat area, such as downstream locations private in-holdings near Whitaker Ranch, the number of anglers in these locations is substantially less than those who use the Frenchman's Flat area upstream to the Pyramid Dam Bridge.

Pursuant to Article 52 of FERC's license 2426 for the California Aqueduct and in accordance with the Davis-Dolwig Act, CDWR has provided the flows necessary to maintain a year round trout fishery in middle Piru Creek between Pyramid Dam and Frenchman's Flat. To implement this license requirement, the CDFG releases a total of 3,000 pounds of hatchery-raised fish into middle Piru Creek at Frenchman's Flat between November and May. According to CDFG fishery biologists, an annual allotment of 3,000 pounds of fish is the maximum that the creek can sustain. Trout reproduce naturally upstream of Frenchman's Flat, and the creek in this location is designated as a catch-and-release area. The catch-and-release area extends from the weir upstream of Frenchman's Flat (located at approximately creek mile 1 on Figure 2-2) to the Pyramid Dam Bridge. Downstream of the weir anglers are allowed to keep their catch. Rainbow trout are the primary fish sought by anglers using the site, and in general are the only fish caught and kept, although smallmouth bass, largemouth bass, and blue gill have been identified downstream of Frenchman Flat. Some fishermen also use the creek for cray-fishing (CDWR, 2004a).

Under contract to CDWR, Aspen Environmental Group conducted a series of creel surveys from October 2003 through September 2004. Aspen biologists received creel census training from the CDFG prior to these surveys. Each month, four weekday and four weekend dates were randomly chosen for surveying. Field data were recorded for each fisherman present during the survey dates and included information such as the type and number of fish caught, length and weight of the fish if kept, angler satisfaction, and angler demographics. Table 3.4-2 lists the number of anglers interviewed in each of the months surveyed along with the number of fish they caught and released, the average percentage of anglers satisfied with their fishing experience, the size of the fish they caught, and the number of fish they caught. Appendix C provides the monthly summary reports prepared for the creel surveys through September 2004.

Table 3.4-2 Piru Creek Creel Survey Results – October 2003 to September 2004

Month	Number of Anglers	Number of Fish Caught	Number of Fish Released	Angler Satisfaction With:		
				Fishing Experience (%)	Size of Fish Caught (%)	Number of Fish Caught (%)
October	52	80	80	62	46	44
November	67	130	110	90	50	49
December	76	186	138	92	66	58
January	142	317	267	80	44	42
February	93	63	38	82	29	22
March	150	365	212	87	63	55
April	221	663	447	96	62	56
May	101	622	508	94	72	53
June	61	209	209	88	57	35
July	49	160	155	78	49	51
August	29	35	35	75	37	25
September	15	33	33	88	22	22

Source: Creel Census Surveys, Appendix C

With the exception of February, during which heavy rainfall lowered the number of anglers, and May, when the number of non-fishing users dramatically increased, the number of anglers increased each month. The total number of anglers using middle Piru Creek during April was the highest recorded to date and increased 67 percent in comparison to March. Fly fisherman comprised the majority of anglers and use both Frenchman's Flat and middle Piru Creek upstream of Frenchman's Flat. As a group, all anglers released approximately 78 percent of fish caught. Most fly fisherman released the majority of fish caught even when not fishing in the catch-and-release area. Based upon the 2003-2004 creel surveys, angler use of middle Piru Creek upstream of Frenchman's Flat is higher during weekend periods by a factor of approximately two to one. Angler usage at Frenchman's Flat increased only slightly during weekends. Non-fishing uses of the Frenchman's Flat area conflict with the optimum conditions sought by fishermen, thereby prompting fishermen to relocate to other areas of middle Piru Creek. Greater angler use of middle Piru Creek upstream of Frenchman's Flat may be the result of increased day use by waders and picnickers at Frenchman's Flat during the weekends.

Based upon the creel surveys conducted to date, those anglers fishing in the catch-and-release areas generally enjoyed their fishing experience more than anglers seeking fish for consumption. Overall, approximately 54 percent of the anglers were satisfied with the size of the fish caught, and 47 percent indicated they were satisfied with the number of fish caught. Despite relatively low levels of satisfaction with the number and size of fish caught, angler satisfaction with their fishing experience was relatively high, ranging from 62 percent to 96 percent, with an average over the survey period of 78 percent. In

general, anglers who catch fish for consumption indicated they were rarely satisfied with the number or size of the fish taken and consistently requested that CDFG stock larger trout.

Anglers have commented on the dense riparian vegetation located along the stream banks, which affects the fly fishermen's ability to cast effectively into the stream. Likewise, several anglers requested some kind of effort to remove non-native wildlife species that prey on trout eggs in the catch-and-release area, such as bullfrogs and crayfish. Poaching continues to be a concern, and incidents of pond turtle netting have been reported to creel survey monitors. Requests have also been made from the anglers for additional USFS and CDFG patrols in the area.

Demographic Profile of Recreational Users

Due to the rural nature of the proposed project area and its location on National Forest lands, a demographic profile of the residents in the vicinity of the proposed project would provide little useful data because the resident population is small and widely dispersed. Additionally, a traditional demographic profile constructed using U.S. Census Bureau data for the area would not provide a useful depiction of the large numbers of recreational users who visit the proposed project area from other places.

Ethnic, racial, and economic demographic data have not been explicitly collected from the recreational users of the proposed project area. Creel census monitors have collected the zip codes of the anglers interviewed from the beginning of the surveys in October 2003; since April 2004 the monitors have also attempted to estimate the total number recreational users visiting middle Piru Creek between Pyramid Dam Bridge and Frenchman's Flat. Using the demographic characteristics of each zip code, weighted by the number of anglers from each zip code, a rough demographic profile can be constructed for anglers who use middle Piru Creek between Pyramid Dam Bridge and Frenchman's Flat. Although this technique does not provide a detailed demographic profile of the users of middle Piru Creek, it does summarize the general demographic attributes of the anglers.

Anglers interviewed in the 2003-2004 creel census surveys traveled to Piru Creek from the counties of Los Angeles, Ventura, Orange, Santa Barbara, Modoc, and San Bernardino, as well as from Maryland, Montana, Colorado, and Germany. According to the estimated demographic profile as shown in Table 3.4-3, anglers at middle Piru Creek are fairly representative of the surrounding area (Los Angeles and Ventura Counties) with regard to race and economic status. While a few anglers were from outside these two counties were recorded, they represented an extremely small fraction of the anglers and thus were not included in the determination of demographic attributes. Estimating from the zip code information provided to the creel census monitors, of the anglers coming to middle Piru Creek, approximately 62 percent are likely to be Caucasian, 5 percent to be African-American, 1 percent to be American Indian or Alaska Native, 11 percent to be Asian, less than 1 percent to be Native Hawaiian and Other Pacific Islander; 16 percent are likely to identify themselves as another race, and 5 percent are likely to represent two or more races. Approximately 34 percent of the anglers are likely to be Hispanic. Twelve percent are likely to have incomes below poverty level (CDWR, 2004a).

3.4.3 Applicable Regulations and Significance Criteria

The proposed project area is located in Angeles and Los Padres National Forests; it also lies in Los Angeles and Ventura Counties. Construction and operation of Pyramid Dam and its related water releases into middle Piru Creek fall under the regulatory authority of FERC (FERC Project 2426), for which CDWR and LADWP are co-licensees. A part of the California Aqueduct's original FERC

Table 3.4-3 Demographic Profile of Recreational Anglers Based on Zip Code Data Collected in the 2003-2004 Creel Census Surveys

Population	Caucasian	African-American	American Indian	Asian	Pacific Islander	Other	Two or More	Hispanic Origin*	Poverty
County of Los Angeles	49%	10%	<1%	12%	<1%	24%	5%	45%	18%
County of Ventura	70%	2%	<1%	5%	<1%	18%	4%	33%	9%
Anglers using Middle Piru Creek	62%	5%	<1%	11%	<1%	16%	5%	34%	12%

Source: U.S. Census, 2000; CDWR, 2004a.

* Hispanic Origin is defined by the U.S. Census bureau as a person whose origin was Mexican, Puerto Rican, Cuban, Central or South American, or some other Hispanic origin. It should be noted that persons of Hispanic origin may be of any race.

approval, a Memorandum of Understanding (MOU) between the USFS and CDWR was executed in 1969. The MOU specifies construction and maintenance requirements for the Aqueduct and requires coordination of the CDWR's Aqueduct-related activities on National Forest lands with the USFS.

3.4.3.1 Federal Regulations

National Environmental Policy Act (NEPA)

NEPA requires federal regulatory agencies to analyze the impacts of proposed federal actions on the human environment using a systematic, interdisciplinary approach to determine if any significant, adverse environmental effects that cannot be avoided or mitigated would result from the action. Along with other issues examined in a NEPA analysis, an action's impacts to recreation and recreational resources must be evaluated. Ultimately, final approval of the proposed project would require a FERC license amendment, the process for which requires documentation of compliance with NEPA. FERC will serve as the NEPA lead agency.

18 Code of Federal Regulations 4.51 (f) – FERC Environmental Report

As noted above, the proposed project would require a FERC licensing amendment. In applying for a license amendment, CDWR would need to comply, as applicable, with the regulations in Code of Federal Regulations (CFR) Title 18, Conservation of Water and Power, Chapter I, Federal Regulatory Energy Commission, Department of Energy, Part 4.51, Contents of Application, Subpart (f)(6) (herein referenced as 18 CFR 4.51(f)(6)), which addresses recreational resources. According to 18 CFR 4.51(f)(6), an environmental report for a license amendment must include the following:

- Descriptions of any existing recreational facilities, uses, and programs to preserve and enhance recreational facilities;
- Descriptions of proposed programs or facilities;
- Identification of entities responsible implementation of proposed programs and facilities, a schedule for their implementation, and a map or plan depicting their location;
- A cost estimate for construction, operation, and maintenance of proposed facilities; and
- Identification and description of any areas in the project boundaries or in its vicinity designated or eligible for National Wild and Scenic River status or Wilderness Area status.

Angeles National Forest Land Management Plan

The Angeles National Forest Land Management Plan recognizes middle Piru Creek as an area heavily used for recreation and an area where seasonal closures may be required to minimize disturbance or

loss of "sensitive" wildlife during critical breeding seasons. The plan stipulates mitigation for and/or restoration of recreational resources damaged by proposed projects within the Forest, as warranted. The plan also identifies the following goals:

- Reduce conflict between recreational users and natural resources;
- Manage recreational areas to reduce conflict where recreation activities may create problems between user groups;
- Make public information available in a variety of languages for areas heavily used by non-English speaking populations; and
- Make "visitor ethics," including the encouragement of peaceful and passive recreational activities, a priority of the public information program objectives.

Los Padres National Forest Land and Resource Management Plan

The proposed project is located in Los Padres National Forest Management Areas 4e, 57b, and 64 as designated by the Los Padres National Forest Land and Resource Management Plan. This plan includes guidelines for recreation, including the following measures intended to protect visitors and reduce law enforcement work:

- Separation of conflicting recreational uses consistent with Management Area objectives;
- Provision of adequate visitor control; and
- Protection of resources and facilities from vandalism.

The management emphasis in Area 4e, which includes the proposed project area as it enters Lake Piru, is on non-motorized general forest recreation and watershed management, which allows for extended trip, day-use hiking, equestrian use, general forest camping, and associated activities. Resource activities in Area 4e are managed to be consistent with the recreation and watershed emphasis.

The management emphasis in Area 57b, which includes the Blue Point Recreation Area along middle Piru Creek, is on developed recreation, which provides for intensive management of highly developed recreation sites to accommodate heavy public demand. Recreational opportunities emphasize water oriented day-use activities, particularly recreational fishing. Resource activities are managed to be consistent with the recreation emphasis.

The management of Area 64 includes the proposed project area between Whitaker Ranch and the boundary between Los Padres and Angeles National Forests (located near creek mile 16 in Figure 2-3). Area 64 is managed for wilderness preservation and management. Recreation opportunities are limited to the use of primitive trails in the area; resource activities are managed for the preservation of wilderness character.

Executive Order 12898

Federal Executive Order 12898, dated 11 February 1994, is intended to ensure that federal agencies identify and address "disproportionately high and adverse human health or environmental effects" of federal projects on minority and low-income populations (USEPA, 1998). As defined by the "Final Guidance for Incorporating Environmental Justice Concerns" in USEPA's NEPA Compliance Analysis (Guidance Document) (USEPA, 1998), minority ("people of color") populations are identified where either:

- The minority population of the affected area is greater than 50 percent of the affected area's general population; or
- The minority population percentage of the affected area is meaningfully greater than the minority population percentage of the regional population or other appropriate unit of geographic analysis.

In 1997, the President's Council on Environmental Quality issued Environmental Justice Guidance, which defines minorities as individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic. Low-income populations are identified using the annual statistical poverty thresholds identified in the U.S. Census Bureau's Current Population Reports, Series P-60 on Income and Poverty (OMB, 1978).

3.4.3.2 State Regulations

California Environmental Quality Act (CEQA)

Under CEQA, California's public agencies are required to identify the significant environmental effects of proposed projects and avoid or mitigate those effects to the greatest extent feasible. As with NEPA, a systematic, interdisciplinary approach is taken to analyze the potential impacts that could result from a project. A project's impacts are evaluated against a series of resource/issue-specific significance criteria to determine the potential effects. The CEQA checklist (Appendix G of the CEQA Guidelines) includes two significance criteria for evaluating a project's potential impacts on recreational resources. These criteria focus on a project's potential to (1) physically deteriorate existing recreational facilities, or (2) require the construction of new recreational facilities. These significance criteria are addressed below in Section 3.4.3.3.

Davis-Dolwig Act

The Davis-Dolwig Act of 1961 declares that the protection and enhancement of recreation opportunities and fish and wildlife resources are objectives of State water projects. The Act calls for CDWR to allocate a portion of the costs of a State Water Project to recreation and fish and wildlife enhancement. CDWR is responsible for planning recreation and fish and wildlife enhancement measures for such projects while the CDFG is responsible for managing their fish and wildlife resources.

California Department of Fish and Game Strategic Plan for Trout Management

The purpose of the CDFG's November 2003 Strategic Plan for Trout Management is to identify key issues and concerns relative to trout fisheries. The plan promotes the use of sound ecosystem management principles while providing diverse angling and recreational opportunities and public education about trout and their habitats. The Strategic Plan stipulates that management of trout must be integrated with other aspects of ecosystem protection, including maintenance of adequate stream flows, protection and restoration of riparian habitat, maintenance of natural biological diversity, restoration of native trout and other native aquatic populations, and preservation of the genetic integrity of native populations.

California State Environmental Justice Guidelines

Currently there are no State laws or regulations, or guidelines for the analysis of environmental justice within the context of a project's environmental review under CEQA. However, the State has a number of recent and proposed legislative actions currently in review associated with environmental justice. Under Assembly Bill 1553, the Governor's Office of Planning and Research is required to adopt guidelines for addressing environmental justice issues in local agencies' General Plans. Some State

agencies have been using Federal guidance to assess the environmental justice impacts of the projects under their review.

3.4.3.3 Significance Criteria

CEQA Guidelines Appendix G recommends that recreation impacts associated with the proposed project may be potentially significant if they would:

- Increase the use of existing neighborhood and regional parks (or in this case, recreational facilities and opportunities within the project area), resulting in physical deterioration.
- Result in substantial adverse physical effects due to the construction of new or alteration of existing recreational facilities.

In the case of the proposed project, significant impacts would also occur if the proposed project would result in decreased opportunities for different types of recreation, such as fishing, swimming, and rafting.

3.4.4 Environmental Impacts and Mitigation Measures

The proposed project would mimic the natural hydrology of middle Piru Creek, which would generally result in higher and faster storm flows during the winter and possibly the spring, and lower and slower flows in the summer and fall. The proposed project would affect different recreational activities differently. Potential impacts to recreational facilities due to increased use because of the proposed project are addressed under Impact R-1. Potential impacts to picnickers, hikers, and campers due to the proposed project are addressed under Impact R-2. Potential impacts to anglers are addressed under Impact R-3. Potential impacts to rafters and kayakers are addressed under Impact R-4.

Impact R-1: Altered Use of Piru Creek Recreational Facilities that Could Result in Their Physical Deterioration

Under the proposed project, middle Piru Creek would have greater flows during storm events and lower flows in the summer and fall, particularly in August and September. These flow rate changes would affect recreational uses of middle Piru Creek.

It is unlikely that increased flows in the winter would result in conditions that would result in a significant change in the number of picnickers, hikers, campers, or anglers as the increased flows would provide no additional recreational benefit to these users and the wet and rainy weather associated with these flows would discourage them. During storms when middle Piru Creek would receive increased flows, it would probably be too cold or rainy for picnickers, hikers, or campers. Additionally, large storm flows entering Pyramid Lake and released from Pyramid Dam could become dangerously high in middle Piru Creek. Depending on lag times, high flows in middle Piru Creek could occur one to two days after a large storm event. As evidenced by the low number of anglers observed in middle Piru Creek during the rains of February 2004 (please refer to the 2003-2004 creel census discussion found in Section 3.4.2), higher winter creek flows would not attract many anglers or be likely to increase angler usage.

During high flows, the Piru Gorge becomes a run of whitewater rapids. Consequently, increased storm flows could increase the use of middle Piru Creek by kayakers and rafters; however, it is not expected that this user increase would be great enough to significantly affect or otherwise physically deteriorate the recreational attributes of middle Piru Creek. Therefore, any physical deterioration resulting from increased use by rafters and kayakers would be considered adverse but less than significant. No direct

or indirect impacts resulting from increased use by other recreation visitors due to greater flows would be anticipated to occur.

It is unlikely that lower summer flows would result in a significant change in the number of anglers using middle Piru Creek. Personal communication between anglers and creel census monitors indicate that middle Piru Creek is not heavily used by anglers in the summer because (1) CDFG stops stocking the creek with trout during summer months, and (2) the crowds of picnickers and campers in the area make it difficult to fish. Consequently, only a few summertime anglers would be affected by lower summer flows. Impacts would be less than significant.

Many picnickers, hikers, and campers visit middle Piru Creek not only for the aesthetic value of the flowing stream but also for the opportunity for water activities. Reduced flows in the summer and fall would adversely affect picnickers, hikers, and campers using middle Piru Creek as the lowered stream flows would have less recreational value to this group of users. Reduced flows would result in lower pool depths along middle Piru Creek. While wading and water play would still be possible under the proposed project, lowered pool levels would substantially diminish the recreational value of middle Piru Creek to swimmers and waders. Swimmers and waders would be directly and adversely impacted by the change in summer flows.

The above would result in an overall decrease in the number of summer and fall visitors over time. This could ultimately benefit visitors' overall enjoyment of the area as the numbers of picnickers and campers are currently so great that existing facilities are deteriorating. Additionally, there would be a reduction in the trash and refuse left behind by visitors, which would also be considered a beneficial impact. A reduction in the number of recreational users of the area would help limit the deterioration of the existing facilities of middle Piru Creek.

Exceptions to simulated natural flows, such as test releases and State Water Project water deliveries to United, would result in negligible contributions to flows and would neither encourage nor discourage recreation use of middle Piru Creek. Deliveries to United would occur during winter months and their associated increases in the creek's water flow would likely be either enjoyed by recreationists or not appreciably noticed, depending on the rate and timing of the deliveries. Test releases would occur only two or three times per year, on average. The maximum amount of water that would be released from the dam during a testing event would consist of 50 cfs for 15 minutes. However, typical test releases would occur for approximately five minutes or less, and testing flow water rates would generally range from approximately 5 to 20 cfs. As addressed in Section 3.2.4, these activities would not result in a substantial change in the creek's overall hydrologic dynamics. Similarly, the project lag time between the recorded inflow of Pyramid Lake and it corresponding outflow to middle Piru Creek would fall within the natural hydrologic dynamics of the creek and would not cause a substantial long-term effect (Section 3.2.4). As such, no direct or indirect deterioration to recreation areas or recreation use from such exceptions or operational constraints would occur.

Portions of middle Piru Creek are typically closed for a few weeks each year during the summer time season. These temporary closures tend to occur when conditions in the creek area are extremely hot and dry, and creek flows are at a minimum. The potential for no flow periods in the creek that could result from the proposed project would likely coincide, at least in part, with forest closures. During these periods there would be no impact on recreational uses in middle Piru Creek.

In summary, the proposed project could create a direct effect on visitors who go to middle Piru Creek for swimming and wading, particularly those seeking an "in-stream" water play experience. However, because (1) creek flow reductions affecting wading and swimming would not occur year-round but only

in the driest summer months (when there are occasional closures for fire safety concerns) and not necessarily every year (complete no flow months in the creek in any given year would be dependent on overall rainfall events in the region), (2) there are recreation areas that provide overall water play opportunities for similar prices in the project vicinity (such as Castaic and Pyramid Lakes), and (3) the capacity of these areas could accommodate the additional (relocated) users from middle Piru Creek, these impacts would be adverse but less than significant. Therefore, no mitigation measures for Impact R-1 are proposed.

If some visitors are discouraged from coming to middle Piru Creek there would be a reduction in the litter and waste left by recreation users, as well as a reduction in vandalism and off-trail trampling of vegetation and habitat. A reduction in visitor waste and associated use would improve the overall conditions of the creek and its surrounding areas and would be considered a beneficial impact. In this way a reduction in the number of middle Piru Creek users would directly and indirectly benefit those recreationists who continue to visit middle Piru Creek.

Impact R-2: Altered Use of Other Nearby Recreational Facilities that Could Result in Their Physical Deterioration

Users of middle Piru Creek who are discouraged by low flows in the summer may choose to go to different recreation facilities in the area for water access. Most of the other public recreation areas in the proposed project's region that have opportunities for wading, swimming, and water play are larger facilities (such as Castaic Lake, Lake Piru, and Pyramid Lake), and also charge a fee for admittance and use.

Lake Piru has the smallest capacity of the other recreation areas in the region around middle Piru Creek, having a maximum summertime capacity of 300 visitors. Lake Piru charges a $7.50 per car admission fee and runs at or near capacity during summer weekends. According to Doug Wess, Park Manager for the Lake Piru Recreation Area, Lake Piru would not have the capacity to accommodate recreationists relocating from middle Piru Creek (Lake Piru Recreation Area, 2004).

Castaic Lake could potentially accommodate additional visitors relocating from middle Piru Creek. In 2003, Castaic Lake received approximately 3,000 to 4,000 visitors on a weekend day. In 2004, after instituting a $2.00 per person admission fee, visitor numbers dropped to approximately 2,500 visitors on a weekend day. Castaic Lake State Recreation Area management is currently considering whether the fee should continue for 2005 (Castaic Lake State Recreation Area, 2004). If the fee requirement remains in effect, it is likely that the lake would have capacity to accommodate users from middle Piru Creek. However, if the management decides that admission to the lake should again be free, additional users from middle Piru Creek could cause the visitor capacity of Castaic Lake to be met more quickly.

Pyramid Lake also has the potential to accommodate additional visitors from middle Piru Creek. Pyramid Lake charges $7 per car for admission and has different capacities for different lake uses, such as jet skiing, boating, picnicking, and swimming. Once the capacity for a use has been reached during the day, additional users may wait outside the gate to the lake for others to leave so that they may enter. According to District Ranger Cid Morgan of the Santa Clara and Mojave Rivers Ranger District, which manages Pyramid Lake as well as the recreation area along middle Piru Creek, the lake commonly reaches capacity for jet skiers and boaters, but rarely reaches capacity for picnickers and swimmers. When capacity for swimmers and picnickers is reached on occasion, it occurs on particularly high traffic holiday weekends (USFS, 2004b).

If all of the recreationists currently using middle Piru Creek were discouraged from using the proposed project area and relocated to another single location, they could contribute to the physical deterioration of that location. There is no way to reasonably predict what other single recreation area the recreationists would go to. Consequently, a determination of the potential impacts on another single location is considered speculative. It is noted, however, that it is highly unlikely that all recreationists would relocate to another single location. If these users were to disperse (relocate) to other locations such as Castaic and Pyramid Lakes, their impacts on those areas would be considered adverse but less that significant because the total increase in users at any one location would relatively small compared to the total capacity of these facilities.

There are no other creeks in the area that are easily accessible for water play. Sespe Creek is difficult to access and cannot accommodate many visitors (USFS, 2004a). Pyramid and Castaic Lakes would not provide for the same experience as swimming and wading in a stream; however, these lakes would provide the water needed for the general swimming and wading experiences sought by some visitors using middle Piru Creek, particularly those accessing Frenchman's Flat. While each of these two lakes charges an admission fee, use of the Frenchman's Flat area also requires the purchase of an Adventure Pass. Costs for admission into these nearby lakes are similar to the cost of an Adventure Pass. The relocation of middle Piru Creek visitors would not be anticipated to directly change entrance fees that must already be paid. Therefore, no direct or indirect environmental justice impacts would occur.

Exceptions to simulated natural flows, such as test releases and water deliveries to United, and the one to two day lag time between the recorded inflows and corresponding outflows to middle Piru Creek would result in negligible impacts to other recreation areas or the users of other recreation areas. Any impacts would be less than significant.

All impacts to other nearby recreational facilities that could occur due to the proposed project are considered less than significant or none. Therefore, no mitigation measures for Impact R-2 are considered necessary.

Impact R-3: Altered Recreational Opportunities for Anglers

Anglers using middle Piru Creek would be directly affected by the proposed project because changes to existing stream flows would alter the fish habitats that support fishing activities along the creek. Some of the changes resulting from the proposed project would serve to improve fish habitats, but simulation of natural flows would also reduce the viability of fish populations during the summer. As described for Impact R-1, infrequent exceptions to simulated natural flows, such as test releases and water deliveries to United, would result in negligible contributions to the creek's overall flows. These exceptions would neither directly nor indirectly affect anglers by substantially altering conditions for fish populations.

During the winter and spring, flows released from Pyramid Dam would be expected to increase under the proposed project, primarily during storm events, and could provide long-term benefits to fish habitats and anglers. As discussed in Section 3.2.4, increased releases from Pyramid Dam would lower the streambed of middle Piru Creek. Lowering the streambed would naturally deepen existing pools and could excavate new pools over time. The deepening and excavation of pools in middle Piru Creek would benefit the trout that reproduce naturally in middle Piru Creek, as well as the trout that are stocked by the CDFG. Pools provide refuge for trout from predators and changes in weather. As discussed in Section 3.1 (Biological Resources), increased water temperature increases the mortality of trout; but by being able to stay in the cooler water found at the bottoms of pools, trout are able to survive for longer periods of time during hot weather. By improving the number and depth of pools, the proposed project may provide the "wild" trout with better areas to reproduce and grow, and stocked

trout would have a better chance of surviving warmer temperatures. These improved conditions for the trout would also improve fishing for middle Piru Creek anglers by potentially increasing the size and weight of the trout they could catch. Because the improvement of pools would be largely dependent upon the severity of winter storms, it is uncertain how quickly trout populations and, accordingly, anglers would benefit from these effects. Pool improvement could occur within a single season or could require five to ten years of simulated natural winter flows before benefits are realized.

Despite the likely increase in the number and depth of pools, decreases in flows between June and October would result in higher water temperatures and a reduction in the creek's trout population. Due to the number of other recreational users at middle Piru Creek and the fact that the creek is not stocked during the summer, few anglers attempt to fish along middle Piru Creek during this period. Because few anglers typically fish in middle Piru Creek during the period of time when few, if any, trout are be available to catch (i.e., June through October), a reduction to the trout population during the summer would be considered an adverse but less than significant recreational impact.

It is likely, however, that the higher summer water temperatures in middle Piru Creek that would result from implementation of the proposed project would significantly reduce the naturally reproducing trout population. Exhibit S of FERC License 2426 calls for the stocking of 4,000 pounds of trout each year in middle Piru Creek. CDFG fishery biologists believe that 4,000 pounds of trout annually would exceed the carrying capacity of the creek at Frenchman's Flat; consequently only 3,000 pounds of trout are stocked each year (CDWR, 2004b). Although it was believed that trout reproducing upstream of the weir in middle Piru Creek were from wild stock, CDFG fishery biologists have recently found the trout above the weir to be of the same genetic stock as trout released at Frenchman's Flat. Previously, CDFG felt that the naturally reproducing population needed to be kept separate from the hatchery raised trout stocked downstream (CDFG, 2004a). With recent findings, there is no longer a biological need to keep the naturally reproducing and stocked populations separate. The naturally reproducing trout population currently survives the summer temperatures with the assistance of the artificially high summer flows under the current flow regime. The reduction of this population might initially go unnoticed during the summer due to the low number of anglers typically fishing in middle Piru Creek, but the effects would become more apparent as the number of anglers increases in the fall. The reduction of trout would be particularly noticeable to anglers using the catch-and-release area immediately downstream of the Pyramid Dam bridge.

Because the weir upstream of Frenchman's Flat creates a physical barrier to stocked fish moving upstream, any trout caught in the catch-and-release area are believed to be from a naturally reproducing population (albeit one that is of the same genetic material as the stocked fish). According to the 2003-2004 creel census surveys, during periods when the creek was not stocked, the only fish caught either were in the catch-and-release area or were individuals from the naturally reproducing population that had migrated downstream. No trout marked with hatchery tags were caught during this period. From November through May, when the creek is stocked with trout, the number caught in the catch-and-release area from the naturally reproducing trout population is greater than the number of stocked fish caught farther downstream, sometimes by a margin of two- or three-to-one. It should be noted that the fish that are caught in the catch-and-release area are likely to be caught multiple times, as opposed to downstream where a fish is likely only caught once. It should also be noted that heavy poaching using gill nets and other methods has been observed in the catch-and-release area, which removes numerous fish from above the weir. Despite all the poaching that occurs, the creel census surveys indicate that the best fishing in middle Piru Creek is in the catch-and-release area. Reduction of this population by a reduction of summer flows and subsequent increase in water temperature would substantially impact the recreation experience of middle Piru Creek anglers. In this manner, the proposed project would result

in direct, adverse impacts to anglers. Reduction of the naturally reproducing trout population and its effect on angling in middle Piru Creek would be considered a significant impact but may be mitigated to a less than significant level by stocking fish above the weir, as described in Mitigation Measure R-3.

It should be noted that if CDFG, USFS, and other agencies agree, there is a possibility that the weir might be removed some time in the future as part of a separate project. Since CDFG fisheries biologists believe that the trout upstream of the weir are of hatchery origin, there does not appear to be any biological necessity for keeping the weir to separate hatchery trout from naturally reproducing ones. The impacts of the proposed project on trout in creek miles 0 to 2 would be the same whether a weir is present or not and in either case could be mitigated to a less than significant level by Mitigation Measure R-3.

The 3,000 pounds of trout that are stocked below the weir on middle Piru Creek are either caught or eventually migrate downstream. If some or all of the additional 1,000 pounds of trout allotted for middle Piru Creek that are not currently being stocked were to be annually added upstream of the weir in the catch-and-release area in the first few months following the dry season, these trout could repopulate the area along with any surviving naturally reproducing trout. With the CDFG's reassessment of the genetic stock of the naturally reproducing and hatchery-raised trout, there is no need to separate the populations and the introduction of hatchery-raised trout would not substantially change the genetic stock of the fish in that area. If a dry season were to be particularly mild or wet, there is a possibility that the naturally reproducing trout population would survive and fewer trout (or even no trout) would need to be stocked in the catch-and-release area. It is possible, however, that the catch-and-release area would need to be restocked every year. Implementation of Mitigation Measure R-3 would improve fishing conditions under the proposed project and reduce impacts to anglers to less than significant levels.

Mitigation Measure for Impact R-3

MM R-3 Stock some or all of the additional 1,000 pounds of trout allotted in Piru Creek each year as determined appropriate by CDFG fisheries biologists. In addition to the 3,000 pounds of trout stocked annually in middle Piru Creek, some or all of the remaining 1,000 pounds of trout allotted may be stocked between the base of Pyramid Dam and the weir upstream of Frenchman's Flat. Prior to the beginning of the stocking season, CDWR shall consult with CDFG fishery biologists to determine a suitable amount of trout, up to 1,000 pounds, to stock upstream of the weir to maintain a catch-and-release trout population.

Impact R-4: Altered Opportunities for Rafters and Kayakers

As discussed under Impact R-1, the change in flow regime resulting from the proposed project would benefit rafters and kayakers on middle Piru Creek. No rafters and kayakers were observed during the 2003-2004 creel census surveys, but anglers and CDWR personnel have reported occasionally seeing rafters or kayakers (CDWR, 2004a). Although the lower summer flows likely to occur under the proposed project would not allow rafting and kayaking, even existing summer flows are too low to allow for these activities in all but the deepest of areas along the creek. Increased storm flows in the winter and spring based on in-flow into Pyramid Lake would provide flows and water levels more conducive to rafting and kayaking and would also wash away some of the woody debris hazardous to rafters and kayakers. As described for Impact R-1, above, the proposed project would improve conditions for rafting and kayaking and would be considered a direct beneficial impact to these recreation users.

As described above under Impact R-1, operational exceptions to the proposed release schedule, such as infrequent test releases and water deliveries to United, and projected operational lag times would result in negligible contributions to the creek's overall hydrology and would not significantly improve or diminish the recreation experience along middle Piru Creek for rafters or kayakers.

No adverse impacts to kayakers and rafters are anticipated as a result of the proposed project. Therefore, no mitigation measures for Impact R-4 are considered necessary.