

# Combie Reservoir Water Supply and Maintenance Project

## Preliminary Biological Evaluation for CEQA Initial Study



*submitted to:*

**Nevada Irrigation District**

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## INTRODUCTION

Mercury contamination associated with historical gold mining practices has significantly and adversely impacted the waters of the Sierra Nevada. An estimated 26 million pounds of liquid mercury was used for gold extraction in the Sierra between the late 1840s and 1880s during the California Gold Rush (Churchill 1999), as much as 30 percent of which was likely lost to the environment (Bowie 1905). As a result, mercury continues to enter local streams, rivers, and reservoirs, and in many cases, a legacy of hydraulic mining practices has served to accelerate erosion and associated rates of mercury contamination in these waters.

The Bear River watershed is among the most contaminated in the Sierra Nevada with respect to mercury derived from historical gold mining activities (Slotten et al. 1997; Alpers et al. in prep.). Hundreds of millions of tons of hydraulic mine wastes remain stored in tributaries of the Bear River (Curtis 1999; James 1989, 1993, 1999; Curtis et al. 2005). The downstream influx of such sediments, particularly during winter storm events, requires that water storage capacity in reservoirs along the Bear River be maintained through routine dredging. Combie Reservoir is one such water supply reservoir owned and operated by the Nevada Irrigation District (NID). However, dredging operations at Combie Reservoir were halted in 2003 due to elevated mercury concentrations in the dredge effluent detected during routine sampling to meet California Regional Water Quality Control Board (CRWQCB) permit requirements for dredging. Mercury was being mobilized along with sand and finer particulates during dredging activities. Testing confirmed that samples exceeded 50 nanograms per liter (ng/L) of unfiltered water, which is the relevant water-quality criterion based on the United States Environmental Protection Agency's (USEPA) California Toxics Rule. Thus, dredging operations were halted and the reservoir has been filling in with sediment with each storm event since.

Mercury is known to methylate into an organic form, methylmercury, which is a potent neurotoxin that can bioaccumulate rapidly through aquatic and terrestrial food webs. Humans and wildlife are among the most sensitive to methylmercury exposure (Davidson et al. 1998, Wolfe et al. 1998). The California Office of Environmental Health Hazard Assessment (OEHHA) has issued a health advisory prohibiting and/or restricting the consumption of fish from waters in the Bear River watershed, and Combie Reservoir is included on California's List of Water Quality Limited Segments under Section 303(d) of the 1972 Clean Water Act due to mercury contamination.

NID, however, has a fiduciary responsibility to restore and maintain storage capacity and water supply availability as a water purveyor according to the State Water Code. As such, improving water quality and permitting dredging activities to resume at Combie Reservoir are of paramount interest. To this end, NID has sought and acquired grant funding to begin implementing an innovative mercury removal project at Combie Reservoir.

The Combie Reservoir Mercury Extraction Project (Project) introduces a synergistic approach to reducing elemental mercury concentrations and restoring water storage capacity through the integration of an innovative mercury extraction process with resumed gravel mining operations at the head of the reservoir. Through collaboration and coordination with many organizations, agencies, and other stakeholders, this Project will utilize this technology in a new application to remove elemental mercury from sediments dredged from Combie Reservoir as part of storage capacity maintenance. Project benefits will include ecosystem restoration; water supply reliability; recreation and public access; and water quality protection and improvement. If this Project proves successful at Combie Reservoir, the potential applicability of transferring mercury extraction operations to other reservoirs throughout the Sierra Nevada will be significant to the remediation and reduction of mercury contamination not only in Sierran waters but also in downstream reaches including the California Bay-Delta.

### **Scope of Work**

Garcia and Associates (GANDA) was contracted by the NID to provide biological consultation services during the Initial Study phase of the Project. This report constitutes a preliminary biological evaluation for the Project, providing the necessary information for completion of the California Environmental Quality Act (CEQA) Initial Study and Checklist, and to support subsequent environmental determinations. The focus of this document is to identify and assess biological resources in the Project area, evaluate potential impacts to these resources, and recommend mitigation measures to avoid and/or minimize Project impacts. While much of the information herein is also contained in relevant sections of the CEQA Initial Study document prepared by NID (NID 2008), this report is provided as a stand-alone document to allow this information to be referenced and/or appended to various other environmental documentation associated with the Project.

### **Project Background**

Combie Reservoir straddles the Nevada-Placer county line east of the Lake of the Pines community in Nevada county and west of the Meadow Vista community in Placer county (Figure 1). The reservoir was constructed by NID in 1928 and has 5,555 acre-feet of operational storage at full capacity. It is a source of drinking and irrigation water for numerous consumers in Placer and Nevada counties and provides both with recreational opportunities. Combie Reservoir is a terminus water supply reservoir providing water via a canal to the Lake of the Pines Water Treatment Plant that serves southern Nevada County in the Lake of the Pines region.

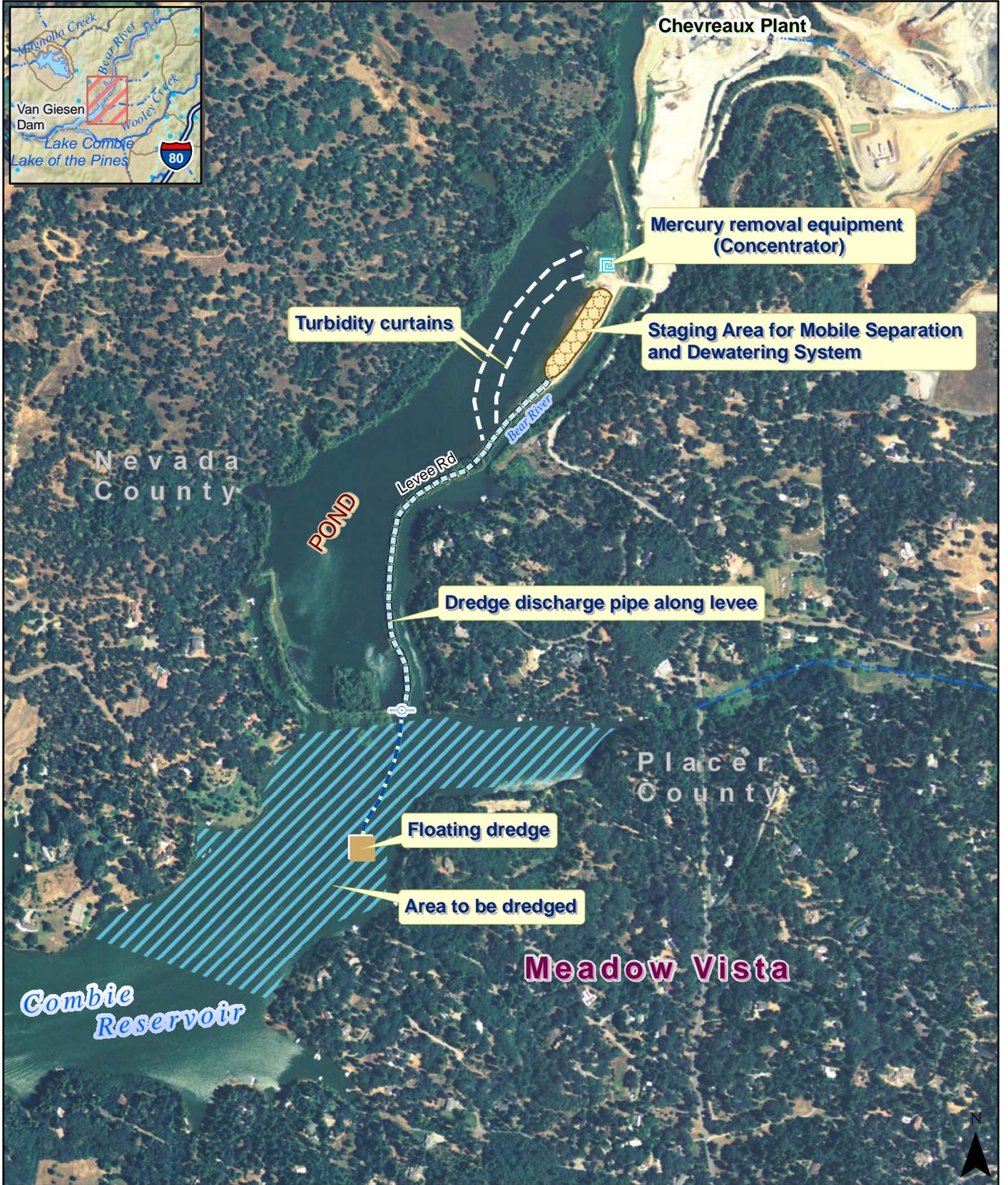
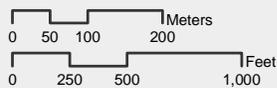


Figure 1. Combie Reservoir Water Supply and Maintenance Project.  
Nevada Irrigation District



Due to the long and narrow shape of the reservoir (0.5 km wide and 3.2 km long) sediments are roughly sized by water action along the length of the reservoir. Grain sizes decrease to the southwest becoming predominantly clay and silt directly behind the dam. This grain size distribution is the result of a decrease in the transport energy of the Bear River upon entering the reservoir such that coarser gravels are deposited first, with progressively finer grains settling out as the transport energy diminishes towards the dam. Since the mid 1960s, Chevreux Aggregates Inc. (Chevreux) has been retained by NID to seasonally dredge the northeastern portion of Combie Reservoir near the Bear River inflow. For the 30 years preceding 2003, all dredging of the reservoir occurred within a large detention pond (approximately 200 m wide, 1200 m long, and 10 m deep) created by the installation of a series of dikes/berms to isolate the working pond from the Bear River and rest of Combie Reservoir. Marketable materials harvested from the reservoir have been sold as road base, construction fill, and some have been processed for concrete and asphalt at Chevreux's Meadow Vista plant, located immediately upstream.

The proposed Project includes the dredging of the delta fan area of upper Combie Reservoir, the removal and separation of mercury from the dredged material, and the transport of marketable by-products to off-site locations. The Project will be conducted over a three-year period and will extract approximately 150,000 to 200,000 tons of sediments that have been deposited in upper Combie Reservoir. If this Project proves successful, NID will perform regular maintenance dredging of Combie Reservoir using the mercury removal technology on an ongoing, as needed, basis. The sediment and mercury removal processes are summarized in brief below; refer to the formal CEQA Initial Study document for additional details regarding the project description (NID 2008).

#### ***Mercury Removal Technology and Process Description***

This Project will utilize a proven technology, a Knelson Concentrator (Concentrator), in an innovative application to remove approximately 95 percent of elemental mercury from the suspended sediments during dredging at Combie Reservoir. The Concentrator effectively operates as a centrifuge that separates out mercury and other metals from the slurry. The Concentrator used in this Project will have a 30 cm bowl that spins at 60-80 times the force of gravity. To achieve maximum efficiency, the Concentrator will run as much as 24 hours per day. All mercury extraction equipment will be contained within a closed trailer housing (no noise-related impacts are expected). The overall removal process has four distinct components: 1) sediment removal, 2) mercury removal, 3) water filtration, and 4) monitoring.

*Sediment Removal.* Sediments will be removed using a floating electric dredge and a mechanical centrifuge dewatering system (as manufactured by Eveready Marine Service, or equivalent). The dredged material will be a sand and gravel slurry that is pumped from the dredge site through a pipeline along the levee road to a Mobile Separation and Dewatering System (MSDS), which includes a complete set of portable equipment used to

dredge, classify, and dewater aggregates from the dredged material. This equipment will feed material directly to the mercury removal equipment (see below).

*Mercury Removal.* Decant water and suspended sediment from the MSDS will be pumped directly to the Concentrator. Mercury and other heavy metals will be extracted within the Concentrator as the water and suspended solids travel through the machine's centrifuge. The tail water (treated effluent) from the Concentrator will be discharged into a containment chamber via a pipe and will flow through a series of containment chambers separated by turbidity curtains (see Water Filtration section below). The extracted mercury and other heavy metals (Concentrate) will be collected and transported to a legal offsite disposal area as required and predetermined by permitting authorities. All recovered mercury will be retired and will not be resold on the open market.

*Water Filtration.* Filtration of effluent water from the Concentrator will take place using a series of containment chambers separated by floating turbidity curtains in the pond. The pond is an existing reservoir feature that is separated from the Bear River and the rest of the reservoir by a series of levees and berms. The containment chambers within the pond will be designed to allow water to pass through the turbidity curtains while suspended (mercury-free) solids are retained in each chamber. Two or more curtains will be used to create three or more containment chambers within the pond. Water will migrate by hydraulic gradient from chamber to chamber towards the reservoir through this series of turbidity curtains, and eventually, clean water will be returned to Combie Reservoir at the south end of the pond through an over-control structure.

*Monitoring.* Monitoring will include environmental sampling, measuring discharge into and out of the reservoir, testing for operational efficiency, monitoring for levee effectiveness, and analyzing this information using adaptive management in order to achieve optimal results.

*Environmental Sampling* will include collecting samples of water, sediment, and aquatic biota (fish and invertebrates) from Combie Reservoir before, during, and after the project to determine whether concentrations of mercury and methylmercury are being reduced as a result of the Project. In addition, water sampling at gaged locations on the Bear River upstream and downstream of Combie Reservoir will determine effects of the Project on transported loads of mercury and methylmercury. The environmental sampling will be designed, conducted, and analyzed by USGS scientists. USGS will monitor Bear River inflows entering Combie Reservoir and flows leaving the reservoir will continue to be measured by NID.

*Operational Efficiency* testing will include regular sampling at different stages in the process. The Concentrator equipment operators will log and record characteristics and results of the extraction process on an hourly basis. Samples will be taken from: the material entering and exiting the Concentrator, the material overflowing from the

sediment basin, each containment chamber, and the clarified water that is returned to the reservoir. Samples will be taken at specific intervals consistent with operations. Samples will be analyzed for suspended sediment, mercury, and grain size fraction.

*Barrier Effectiveness* will be monitored using wells drilled along multiple transects in the levee separating the pond from Bear River. The wells will allow for samples to be taken from the groundwater in order to determine if mercury is migrating through the levee.

*Adaptive Management.* A Technical Advisory Committee (TAC) will be formed to evaluate monitoring data collected during the life of the Project. Monitoring results will provide the TAC with information needed to optimize the degree and timing of operations and determine the effectiveness of the mercury removal process. The role of the TAC will include:

- a) Quality assurance and quality control (QA/QC);
- b) Reviewing water quality data;
- c) Providing guidance on operations and engineering; and
- d) Making recommendations to equipment operators.

For further details and additional Project description, refer to the complete CEQA Initial Study document prepared by NID (NID 2008).

# ENVIRONMENTAL SETTING

## Existing Biological Conditions

Because the Project area primarily consists of inundated portions of the reservoir, the existing biological conditions described in this section largely focus on aquatic biota such as fishes, herpetofauna, and semi-aquatic wildlife; however, the small amount of terrestrial habitat present within Project area along the levee road and fill area is also described. GANDA biologists conducted reconnaissance-level field surveys of the reservoir, pond, and levee road and fill areas as part of the CEQA Initial Study effort, however no sampling or quantitative population surveys were performed. The existing conditions information compiled below includes information from these reconnaissance-level surveys, any available information from previous sampling efforts or biological literature, and queries of state and federal special-status species databases (see Special-Status Species Section below).

### Fishes

Combie Reservoir lies within the Central Valley Subprovince of Sacramento-San Joaquin Zoogeographic Province (*sensu* Moyle 2002). Like many reservoirs created for water supply in the Sierra Nevada, Combie Reservoir likely supported a native stream-adapted fish fauna in the first few years after it was initially filled. The Bear River at this elevation (approximately 500 m or 1600 feet) lies within the zone of the pikeminnow-hardhead-sucker fish assemblage. However, these native fishes were likely replaced within several years in the new reservoir environment that favored more lake-adapted alien species. Such alien species, particularly largemouth and smallmouth bass, also served as effective predators of young native fishes, further reducing the chance of maintaining significant native fish populations in the reservoir.

Today, Combie Reservoir supports a fish fauna typical of a mid-elevation Central Valley water-supply reservoir, including mostly introduced species and some natives. A list of these fish species is provided in Table 1. Native fishes may include Sacramento pikeminnow, Sacramento sucker, hardhead, tui chub, hitch, and inland silverside. Non-native fishes likely include bluegill, green sunfish, largemouth bass, spotted bass, smallmouth bass, common carp, golden shiner, threadfin shad, black crappie, brown bullhead, white catfish, channel catfish, western mosquitofish, and hatchery-strain rainbow trout. No fish population sampling was performed as part of the CEQA Initial Study effort for this Project; however, recent sampling efforts (between 1999 and 2006) by USGS documented a predominance of centrarchids and other introduced species in Combie Reservoir (May et al. 2000, Alpers et al. in prep). Indeed, numerous centrarchids (mostly adult and juvenile largemouth and spotted bass) were observed during an initial site visit during April 2008.

**Table 1.** Native and Introduced Fishes Likely to Occur in Combie Reservoir.

Common Name	Scientific Name	Native/Introduced
Basses and Sunfishes (Family Centrarchidae)		
Largemouth bass	<i>Micropterus salmoides</i>	introduced
Spotted bass	<i>Micropterus punctulatus</i>	introduced
Smallmouth bass	<i>Micropterus dolomieu</i>	introduced
Bluegill sunfish	<i>Lepomis macrochirus</i>	introduced
Green sunfish	<i>Lepomis cyanellus</i>	introduced
Black crappie	<i>Pomoxis nigromaculatus</i>	introduced
Catfishes (Family Ictaluridae)		
Brown bullhead	<i>Ameiurus nebulosus</i>	introduced
White catfish	<i>Ameiurus catus</i>	introduced
Channel catfish	<i>Ictalurus punctatus</i>	introduced
Minnows (Family Cyprinidae)		
Sacramento pikeminnow	<i>Ptychocheilus grandis</i>	native
Hitch	<i>Lavinia exilicauda</i>	native
Hardhead	<i>Mylopharodon conocephalus</i>	native
Common carp	<i>Cyprinus carpio</i>	introduced
Golden shiner	<i>Notemigonus crysoleucas</i>	introduced
Suckers (Family Catostomidae)		
Sacramento sucker	<i>Catostomus occidentalis</i>	native
Trout and Salmon (Family Salmonidae)		
Rainbow trout (hatchery strain)	<i>Oncorhynchus mykiss</i>	introduced
Sculpins (Family Cottidae)		
Prickly sculpin	<i>Cottus asper</i>	native
Livebearers (Family Poeciliidae)		
Western mosquitofish	<i>Gambusia affinis</i>	introduced
Herrings (Family Clupeidae)		
Threadfin shad	<i>Dorosoma petenense</i>	introduced
Silversides (Family Atherinopsidae)		
Inland silverside	<i>Medinia beryllina</i>	introduced

The presence of Van Giesen Dam, which impounds Combie Reservoir, as well as other dams located downstream on the Bear River, block access for all migratory fishes. Therefore, anadromous salmonids including steelhead and salmon have been excluded from this portion of their historical range. Hatchery-strain rainbow trout may occur in Combie Reservoir as a result of put-and-take stocking programs to enhance recreational fishing; however, the prevailing warm-water conditions in the reservoir are generally unsuitable for salmonids. Additionally, the predominance of centrarchid predators such as largemouth and smallmouth bass otherwise limits the recruitment of salmonids in the reservoir.

## Herpetofauna

The shoreline and littoral zone of Combie Reservoir provide habitat for several reptile and amphibian species. Native herpetofauna species that may occur in the area include northwestern pond turtle (NWPT; *Actinemys marmorata marmorata*), Pacific tree frog (*Hyla regilla*), California red-legged frog (*Rana aurora draytonii*), long-toed salamander (*Ambystoma macrodactylum*), common garter snake (*Thamnophis sirtalis*), and western terrestrial garter snake (*Thamnophis elegans*). Bullfrog (*Rana catesbeiana*) is the most likely introduced herpetofauna species to occur in Combie Reservoir.

Woody debris and logs along the south-facing shores of the reservoir and pond provide good basking areas for NWPT, and some upland areas are suitable for NWPT breeding. Several NWPT were observed basking in the reservoir and in the pond by GANDA biologists during an initial site survey in April 2008.

## Birds

Numerous bird species may occur in Combie Reservoir including waterfowl, shorebirds, other migratory water birds, and raptors. The following species were observed during the initial site visit in April 2008: wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), bufflehead (*Bucephala albeola*), common merganser (*Mergus merganser*), double-crested cormorant (*Phalacrocorax auritus*), killdeer (*Charadrius vociferus*), pied-billed grebe (*Podilymbus podiceps*), Canada goose (*Branta canadensis*), song sparrow (*Melospiza melodia*), rough-winged swallow (*Stelgidopteryx serripennis*), American coot (*Fulica americana*), belted kingfisher (*Megaceryle alcyon*), Stellar's jay (*Cyanocitta stelleri*), red-shoulder hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), California quail (*Callipepla californica*), green heron (*Butorides virescens*), and great blue heron (*Ardea herodias*).

Although they were not observed during the site visit, osprey (*Pandion haliaetus*) and bald eagle (*Haliaeetus leucocephalus*) may forage at Combie Reservoir and along portions of the Bear River. Although unlikely, California black rail (*Laterallus jamaicensis coturniculus*) could also occur in the Project area.

## Mammals

Mammals that could occur at Combie Reservoir include: northern river otter (*Lontra canadensis*), American mink (*Neovison vison*), muskrat (*Ondatra zibethicus*), water shrew (*Sorex palustris navigator*), American beaver (*Castor canadensis*), and bats that feed over aquatic areas such as yuma myotis (*Myotis yumanensis*).

## Plants

A small amount of riparian and upland area is included in the Project area. Terrestrial portions include the levee road and fill area where the mercury extraction equipment will be located. The road and fill areas are dominated by ruderal vegetation. The dominant

vegetation in this community is white sweetclover (*Melilotus alba*). Other ruderal species present include: yellow star-thistle (*Centaurea solstitialis*), rose clover (*Trifolium hirtum*), St. John's wort (*Hypericum perforatum*), black mustard (*Brassica nigra*), cheat grass (*Bromus tectorum*), and soft chess brome (*Bromus hordeaceus*). Within this community are a few native annuals including: mountain navarretia (*Navarretia divaricata*), charming centaury (*Zeltarium venustum*), and mugwort (*Artemisia douglasiana*).

A narrow band of riparian vegetation is present along either side of the levee road and around the margins of the reservoir and pond. Riparian vegetation is dominated by an upperstory of willows including: arroyo willow (*Salix lasiolepis*), dusky willow (*Salix melanopsis*), and red willow (*Salix laevigata*), as well as gray alder (*Alnus incana*) and cottonwood (*Populus* spp.). The understory is dominated by Himalayan blackberry (*Rubus discolor*). Other species present include: coyote brush (*Baccharis pilularis*), scrub oak (*Quercus berberidifolia*), and curly dock (*Rumex crispus*).

Emergent vegetation along the edge of the river and reservoir includes: cattail (*Typha latifolia*), bulrushes (*Scirpus* spp.), rushes (*Juncus* spp.), spike-rush (*Eleocharis* spp.), and horsetails (*Equisetum* spp.).

The shoreline and surrounding slopes of the reservoir are comprised of Sierran mixed conifer forest (Holland 1986) dominated by ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), and California black oak (*Quercus kelloggii*). Also present in this community are species of manzanita (*Arctostaphylos* spp.) and ceanothus (*Ceanothus* spp.).

## **Special-Status Species**

### ***USFWS and CNDDDB Species Lists***

The United States Fish and Wildlife Service (USFWS) maintains a database of federally threatened and endangered species that can be queried per USGS 7.5-minute quadrangle map areas. The USFWS list includes all federally listed plant and animal species that are known to occur or may potentially occur within the quadrangle(s) designated for each query. Similarly, the California Department of Fish and Game (CDFG) maintains the California Natural Diversity Database (CNDDDB), which inventories the status and locations of rare plants and animals in California.

Both the USFWS Threatened and Endangered Species Database (USFWS 2008a) and the California Natural Diversity Database (CNDDDB) (CDFG 2008a, 2008b) were queried for potential occurrences and known records of special-status species in the Lake Combie 7.5-minute USGS quadrangle that encompasses the Project area and surrounding region (see Appendices A and B). These queries resulted in four special-status fishes, one amphibian, one reptile, one invertebrate, and two plant species (see Table 2). Table 2 also lists several

other special-status species that were not included on the USFWS or CNDDDB lists for the Lake Combie quadrangle, but have some potential to occur in the Project area (based on professional opinion and a wider search of surrounding quads in CNDDDB). All species listed in Table 2 are discussed in greater detail below. CNDDDB records for all eight quads surrounding the Lake Combie quad were also queried (CDFG 2008b); these included the: Auburn, Chicago Park, Colfax, Gold Hill, Grass Valley, Greenwood, Rough and Ready, and Wolf quadrangles.

### **Hardhead**

Hardhead (*Mylopharodon conocephalus*) is large native minnow that may occur in Combie Reservoir. This California Species of Special Concern is widely distributed in low- to mid-elevation streams and reservoirs in the Central Valley and Sierra Nevada foothills, from the Kern River drainage in the south, to the Pit River drainage in the north.

Hardhead generally live in waters where summer temperatures are greater than 20°C. Cech et al. (1990) demonstrated that hardhead are relatively intolerant of low oxygen levels, particularly at higher water temperatures, which may limit their distribution to well-oxygenated streams and the surface waters of reservoirs (Moyle et al. 1995). Hardhead are omnivores that forage for invertebrates and algae, and in reservoirs they are known to eat zooplankton such as cladocerans (Wales 1946). Mature hardhead (typically age 2+ fish) spawn during April and May (Reeves 1964 and Grant and Maslin 1997) and may migrate upstream into tributary streams as far as 30 to 75 kilometers (Wales 1946 and Moyle et al. 1995). Spawning behavior is not well documented, but large aggregations of fish can be found in rivers and streams during spawning season, and fertilized eggs are deposited on gravel beds in riffles, runs, and at the heads of pools (Moyle 2002).

Historically, hardhead were abundant enough in some reservoirs to be regarded as a problem species that competed with trout and other sport fishes for food resources; however, most reservoir populations have proven to be the temporary result of colonization by juveniles before introduced predators such as centrarchid basses became established (Moyle et al. 1995). Hardhead populations can persist in reservoirs where introduced predators are not abundant, but reservoir conditions that favor such non-natives usually result in decreased hardhead populations (Moyle 2002). Crashes of reservoir hardhead populations have been reported from Shasta Reservoir, Pardee Reservoir, Millerton Reservoir, Berryessa Reservoir, Don Pedro Reservoir, and Folsom Reservoir (Bell and Kimsey 1955; Kimsey et al. 1956; Reeves 1964; Moyle 2002). However, hardhead remain abundant in a few mid-elevation reservoirs managed for hydropower generation, where water-level fluctuations effectively reduce the reproductive potential of many introduced species (Moyle et al. 1995).

Despite their fairly wide distribution in California, hardhead populations are becoming increasingly isolated from one another, making them vulnerable to localized extinctions

**Table 2.** USFWS and CNDDDB special-status species for the Lake Combie quadrangle. Additional species not on the state or federal list that may potentially occur in the Project area are also included.

Species	Status <sup>1</sup> USFWS/CDFG	General Habitat	Breeding/Flowering Season	Potential to Occur in Project Area
<b>FISHES</b>				
<i>Mylopharodon conocephalus</i> <sup>4</sup>	N/SSC	Low to mid-elevation rivers and some reservoirs; prefer deep pools and runs, cool water	April-May	UNKNOWN (may be present in river, less likely in reservoir)
Hardhead <sup>4</sup>				
<i>Hypomesus transpacificus</i> <sup>2</sup>	T/N	SF Bay-Delta, low-elevation marshes and sloughs; prefer fresh/brackish water mixing zone	February-July	NOT PRESENT (cannot occur above impassable dams)
Delta smelt <sup>2</sup>				
<i>Oncorhynchus mykiss</i> <sup>2</sup>	T/N	Central Valley rivers and tributaries below dams; require cool, well-oxygenated water, clean spawning gravels, access to natal streams	November-June	NOT PRESENT (cannot occur above impassable dams)
Central Valley steelhead <sup>2</sup>				
<i>Oncorhynchus tshawytscha</i> <sup>2</sup>	T/T	Sacramento River and tributaries below dams; require cool, well-oxygenated water, clean spawning gravels, access to natal streams	March-September	NOT PRESENT (cannot occur above impassable dams)
Central Valley spring-run chinook salmon <sup>2</sup>				
Sacramento River winter-run chinook salmon <sup>2</sup>			December-July	
<b>AMPHIBIANS/REPTILES</b>				
<i>Rana aurora draytonii</i> <sup>2</sup>	T/SSC	Perennial and ephemeral ponds and pools with dense emergent/shoreline riparian vegetation closely associated with deep slow or still water	November-April	UNLIKELY (aquatic habitat marginally suitable)
California red-legged frog <sup>2</sup>				
<i>Actinemys marmorata marmorata</i> <sup>3</sup>	N/SSC	Ponds, marshes, lakes, streams, other wetlands; require adequate vegetative cover, exposed basking sites, upland nesting sites	April-August	PRESENT (observed during site survey)
Northwestern pond turtle <sup>3</sup>				
<b>BIRDS</b>				
<i>Haliaeetus leucocephalus</i> <sup>4</sup>	D/E	Nest in conifers and other trees in secluded areas near lakes, reservoirs, and large rivers near key foraging areas	January-August	UNLIKELY (nests/birds not observed during site survey)
Bald eagle <sup>4</sup>				
<i>Laterallus jamaicensis coturniculus</i> <sup>4</sup>	N/T	Expansive marshland habitats dominated by tule/cattail; require water depths < 3 cm for breeding	April-May	UNLIKELY (no extensive marshland present)
California Black rail <sup>4</sup>				
<b>INVERTEBRATES</b>				
<i>Desmocerus californicus dimorphus</i> <sup>2</sup>	T/N	Mature elderberry plants > 2.5 cm basal diameter in riparian areas	March-September	NOT PRESENT (no elderberry present in Project area)
Valley elderberry longhorn beetle <sup>2</sup>				
<b>PLANTS</b>				
<i>Clarkia biloba ssp. brandegeae</i> <sup>3</sup>	N/N	Chaparral, cismontane woodland, often road cuts; between 73 and 915 m elevation	May-July	UNLIKELY (not observed during site survey)
Brandegee's clarkia <sup>3</sup>				
<i>Calystegia stebbinsii</i> <sup>2</sup>	E/E	Chaparral openings, cismontain woodlands, on gabbroic or serpentinite soils; between 185 and 730 m elevation	April-July	NOT PRESENT (not observed during site survey, no serp soils)
Stebbins's morning-glory <sup>2</sup>				

<sup>1</sup> T= threatened; E= endangered, SSC= CA species of special concern, D= delisted, N= no status; <sup>2</sup> Included on USFWS list for the Lake Combie quadrangle

<sup>3</sup> Included on CNDDDB list for the Lake Combie quadrangle; <sup>4</sup> Not included on USFWS or CNDDDB lists but may potentially occur in the Project area

(Moyle 2002). Modification of stream and river habitats by dams and diversions, alteration of natural flow regimes, and competition and predation by introduced species has led to the gradual disappearance of hardhead throughout its historic range (Moyle et al. 1995); hence its status as a California Species of Special Concern.

Although hardhead may be present in portions of the Bear River, their presence in the Project area is less likely, particularly given the abundance of centrarchid basses and other introduced predators known to occur in Combie Reservoir.

### **Delta Smelt**

Delta smelt (*Hypomesus transpacificus*) occur in the San Francisco Bay-Delta, Suisun Bay, and low-elevation marshes and sloughs. They do not occur upstream of the Delta and, thus, do not occur in the Project area. This species was included in the USFWS special-status species list for the Lake Combie quadrangle only because Combie Reservoir and the Bear River are part of the larger Sacramento River watershed, which drains into the San Francisco Bay-Delta. This species only occurs in this watershed far downstream of the Project area. For complete life history information for this species refer to Moyle (2002).

### **Steelhead Trout**

Central Valley steelhead (*Oncorhynchus mykiss*) occur in rivers and streams in the Central Valley and Sierra Nevada foothills. They cannot occur upstream of impassable dams, and thus, do not occur in the Project area. This species was included in the USFWS special-status species list for the Lake Combie quadrangle only because Combie Reservoir and the Bear River are part of the larger Sacramento River watershed. Critical habitat for this species in the Sacramento River drainage does not extend above impassable dams (i.e., the designation does not currently include "blocked habitats"). This species only occurs in this watershed far downstream of the Project area. For complete life history information for this species refer to Moyle (2002).

### **Chinook Salmon**

Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*) and Sacramento River winter-run chinook salmon (also *Oncorhynchus tshawytscha*) occur in the Sacramento River and tributaries in the Central Valley. They cannot occur upstream of impassable dams, and thus, do not occur in the Project area. This species was included in the USFWS special-status species list for the Lake Combie quadrangle only because Combie Reservoir and the Bear River are part of the larger Sacramento River watershed. This species only occurs in the watershed far downstream of the Project area. For complete life history information for this species refer to Moyle (2002).

### **California Red-legged Frog**

The California red-legged frog (CRLF; *Rana aurora draytonii*) is listed as a federally threatened species and designated as a California Species of Special Concern. In 2001, the USFWS formally designated critical and non-critical habitat for this species; however, these designations were reduced in April 2006, although an area in Nevada County is still designated as critical habitat (i.e., portions of the South Fork Yuba River and a tributary to Rock Creek upstream of Englebright Reservoir – approximately 40 km from the Project area). Of four known CRLF occurrences in the general area, the nearest to the Project area is in the Michigan Bluff quad; approximately 26 km away (CDFG 2008b). All are in either perennial or ephemeral ponds, both natural and artificial (i.e., mining sites) in origin.

Historically, CRLF populations were found from Shasta County to Baja California, along both the Coast Range and the west slope of the Sierra Nevada at elevations below 1,500 m (4,900 ft.; Jennings and Hayes 1994). The current range is greatly reduced, with a few highly restricted populations in the Sierra Nevada and most remaining populations occurring along the coast from Marin County to Ventura County. The CRLF sustained a 70 percent reduction in its geographic range due primarily to habitat loss and alteration (e.g., reservoir construction, urbanization, and dispersal barriers), overharvest, and introduction of exotic predators (Jennings et al. 1992). Other factors likely contributing to their decline include contamination of water bodies from irrigation and urban runoff; changes in water temperature, stream hydrograph, and water tables from dams, overgrazing, and prolonged drought. Only a few drainages are currently known to support CRLF in the Sierra Nevada foothills, compared to more than 60 historical records.

CRLF occurs primarily in perennial or ephemeral ponds, pools, and streams where water remains long enough for breeding and development of young (Jennings and Hayes 1994). Specific breeding sites include streams, creeks, ponds, marshes, sag ponds, deep pools, and backwaters within streams and creeks, dune ponds, lagoons and estuaries. Preferred habitats contain dense emergent or shoreline riparian vegetation closely associated with deep (>0.7 m), still, or slow-moving water. The types of riparian vegetation that are most suitable structurally for CRLF include: willows (*Salix* spp.), cattails (*Typha* spp.), and bulrushes (*Scirpus* spp.). The largest summer densities of CRLF are associated with deep-water pools with dense stands of overhanging willows and an intermixed fringe of cattails (Jennings 1988). However, frogs often successfully breed in artificial ponds with little or no emergent vegetation, and have been observed in stream reaches with sparse riparian vegetation. While frogs successfully breed in streams and riparian systems, high spring flows and cold temperatures in streams often make these environments risky for egg and tadpole stages.

Another key habitat indicator for CRLF is the absence or near-absence of introduced predators such as bullfrogs and predatory fish, particularly centrarchids (i.e., basses and sunfishes), which may feed on the larvae at higher levels than naturally co-evolved

predatory species (Hayes and Jennings 1988). Emergent vegetation, undercut banks, and semi-submerged root balls afford shelter from predators (USFWS 1997). CRLF lay their eggs from late November to late April, attaching them to emergent vegetation. Larvae remain in these aquatic habitats until metamorphosis. Eggs hatch in 6 to 14 days and larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae.

There is much variation in how frogs use particular habitats, and in many cases frogs may complete their entire life cycle in a certain area without using other nearby habitat components (i.e., a pond is suitable for each life stage and use of upland habitat or a riparian corridor is not necessary). However, CRLF may disperse upstream, downstream, or upslope of their breeding habitat to forage and seek sheltering habitat. They can be encountered living within streams at distances around three kilometers from the breeding site and have been found up to 30 meters from water in adjacent dense riparian vegetation for over two months (Rathbun et al. 1993). They take shelter in small mammal burrows and other refugia (e.g., moist leaf litter; boulders or rocks; downed trees or logs; industrial debris; watering troughs, abandoned sheds, and incised stream channels) (Jennings and Hayes 1994). During wet periods, CRLF can move long distances between aquatic habitats, traversing upland habitats or ephemeral drainages up to a 1.6 km from the nearest known frog populations. Seeps and springs in open grasslands can function as foraging habitat or refugia for wandering frogs (USFWS 1997).

Although possible, the presence of CRLF in the Project area is unlikely for several reasons. CRLF generally do not occur in large reservoirs, although they can (Storer 1925). The Project area is generally lacking in the type and amount of structural vegetation preferred by this species for breeding and cover. Additionally, the presence of introduced predators, particularly centrarchid fishes and bullfrogs, further reduces the likelihood for CRLF.

### **Northwestern Pond Turtle**

The western pond turtle (WPT; *Actinemys marmorata*) occurs in suitable aquatic habitats throughout California west of the Sierra Nevada and in parts of Oregon and Washington. WPT includes two subspecies, the northwestern pond turtle (NWPT; *Actinemys marmorata marmorata*) and the southwestern pond turtle (*Actinemys marmorata pallida*). NWPT is found north of the San Francisco Bay-Delta, while the southwestern pond turtle is found south of the Bay-Delta. There is evidence to suggest that the two subspecies may integrate between the San Francisco Bay region and the San Joaquin Valley

Both subspecies of WPT are designated as California Species of Special Concern. WPT is the only freshwater turtle native to most of the west coast of temperate North America. They occur from sea level to around 1,830 m (6,000 ft.) from British Columbia south to northwestern Baja California, principally west of the Sierra-Cascade crest. WPT inhabit a wide range of fresh and brackish water habitats (Holland 1991). Habitat quality seems to

be correlated with the abundance of aerial and aquatic basking sites; WPT often reach higher densities where many aerial and aquatic basking sites are available. Preferred habitats for WPT are permanent ponds, lakes, low-flow regions of rivers, and river side-channels and backwater areas. Deep, still water with abundant emergent woody debris, overhanging vegetation, and rock outcrops is optimal for basking and thermoregulation. WPT are uncommon in high-gradient streams probably because water temperatures, current velocity, or lack of food resources limits their distribution (Holland 1991). Although adults are habitat generalists, hatchlings and juveniles require very specialized habitat for survival through the first few years. Hatchlings require shallow water habitat with relatively dense submergent or short emergent vegetation in which to forage. Habitats preferred by hatchlings and juveniles are often relatively scarce and subject to disturbance (Jennings and Hayes 1994).

WPT overwinter in both aquatic and terrestrial habitats. Aquatic refugia consist of rocks, logs, mud bottoms of lakes or ponds, submerged vegetation, and undercut areas along banks. Use of terrestrial overwintering habitat may be more common, and it usually consists of burrows in leaf litter or soil. The presence of a duff layer seems to be a general characteristic of terrestrial overwintering habitat. A radio telemetry study of WPT on the Trinity River in Northern California found they spent as many as seven months of the year (generally October-April) away from the river at overwintering sites, including both terrestrial refuges and lentic bodies of water as far as 500 m from the river. The authors concluded that this overwintering strategy may be an adaptive response to winter flooding of larger rivers (Reese and Welsh 1997)

Female WPT emerge from hibernation sites and travel overland to riparian or other aquatic sites in the spring for mating. Mating occurs in April and May, after which females build nests along wetland margins or in adjacent uplands (Rathburn et al. 1992). Egg laying activity peaks in June and July when females begin to search for suitable nesting sites up to 100 m away from watercourses (Nussbaum et al. 1983). WPT require upland oviposition sites in the vicinity of aquatic habitats. Oviposition requires soil that is at least 10 cm deep, and usually takes place in a southern exposure at a site that will not flood. Nests are typically dug in a substrate with high clay or silt content, but may vary from sandy shorelines to forest soil types. Hatchlings may not emerge from terrestrial nests until spring (March in N. California; Reese and Welsh 1997).

Low fecundity, low hatchling and juvenile survival, high adult survival and potentially long life spans characterize this species (Jennings and Hayes 1994). Western pond turtles are long-lived, with some reaching an estimated maximum life-span of 50 to 70 years, though most individuals may not live that long. They require more than 10 years to attain sexual maturity.

NWPT are known to occur at Combie Reservoir. Several adult NWPT were observed basking in both the reservoir and pond during an initial site visit in April 2008. NWPT will be presumed present for the duration of the Project.

### **Bald Eagle**

The bald eagle (*Haliaeetus leucocephalus*) was federally delisted (as of August 2007), but remains a state endangered and CDFG fully protected species. Although no longer protected by the ESA, the bald eagle will continue to be protected federally by the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act.

Bald eagles are opportunistic, generalized predators and scavengers adapted to aquatic habitats (Buehler 2000). Breeding bald eagles require relatively large bodies of water on lakes, reservoirs, rivers, and marine habitats containing resident populations of suitable-sized fish, generally larger than 200 mm total length (Jackman et al. 1999).

The majority of bald eagles in California breed near reservoirs (Detrich 1986). Most prey taken by eagles on reservoirs in northern California is comprised of carrion fish; fish mortality is typically related to spawning and angling stress (Jackman et al. 2007). Waterfowl supplement the diet of bald eagles, especially in the winter and in the early nesting season (Hunt et al. 1992b). Nests are usually located within one mile of key foraging areas; in California, bald eagles characteristically choose large conifers in relatively secluded locations to build nests (Lehman 1979). Territory-holding bald eagles are year-round residents in ice-free regions of California.

Throughout most of California, the breeding season lasts from about January through July or August. One or two eggs (occasionally three) are laid in late winter or early spring, and incubation lasts about 35 days. Chicks fledge when they are 11 or 12 weeks old. In northern California, eggs are laid in late February and March with young fledging by July. However, at higher altitudes, eaglets may not fledge until August.

In addition to the breeding population, a large number of eagles migrate into California during the winter, primarily November through February. These include returning subadult birds of local natal origin that migrate north in the summer to exploit salmon runs, and breeding eagles from Canada where habitats freeze during the winter (Hunt et al. 1992a and Linthicum et al. 2007). Comprehensive state-wide winter surveys were conducted in the early 1980s and no eagles were seen at Combie Reservoir, nearby Rollins Reservoir, or Lake of the Pines, although two were counted at Camp Far West Reservoir (approximately 25 km from the Project area) in 1980. However, the numbers and distribution of wintering bald eagles has likely increased since these surveys.

The breeding population in California has been increasing by about six percent per year since the early 1980s (Jenkins 1996). From a low of about eight known territories in the late

1950s (Detrich 1986), there were at least 192 recently occupied territories in California in 2003 (R. Jurek, CDFG, unpublished data), and likely over 200 by now. The nearest known bald eagle nest to Combie Reservoir occurs at Collins Lake (Virginia Ranch Reservoir), 32 km northwest of the Project area (CNDDDB 2008). Other nests occur even further away at New Bullards Bar Reservoir, Spaulding Reservoir, Boca Reservoir, Milton Reservoir (Middle Fork Yuba River), Donner Lake, and Union Valley Reservoir (CNDDDB 2008). It is important to note that since their recovery, bald eagles have colonized many foothill and Sierra reservoirs, some of which are detected only during hydro relicensing or other permit-compliance surveys. GANDA biologists conducted a reservoir-wide boat survey on Combie Reservoir for both bald eagle and ospreys in April 2008; no birds or nests were found.

### **California Black Rail**

The California black rail (*Laterallus jamaicensis coturniculus*) is a state threatened and fully protected species. A very small rail about the size of a sparrow, the black rail inhabits densely vegetated saltwater, brackish, and freshwater marshes and wetlands. Historically, California black rails were known from the San Francisco Bay-Delta south along the coast to northern Baja California, in the San Bernardino-Riverside area, at the Salton Sea, and along the lower Colorado River north of Yuma in California and Arizona (Zeiner et al. 1990). Until 1994, the rail was unknown from the Sacramento Valley except for a winter record at Gray Lodge Wildlife Area in Butte County. In 1994, a population of black rails was found at the University of California's Sierra Field Station in Yuba County (Aigner et al. 1995), and other populations have subsequently been found at several previously unknown sites in Butte, Yuba, and Nevada counties (Tecklin 1999). The closest locations to Combie Reservoir include an undisclosed location near Grass Valley (over 30 km away) and at the Spenceville Wildlife Area (approximately 25 km away) near Beale Air Force Base (CNDDDB 2008).

Black rails in the Sierra Nevada foothills are found primarily in extensive marshes dominated by tules and/or cattails, and require water depths less than 3 cm (1.2 in) for breeding (Eddleman et al. 1994). Black rails forage on invertebrates, including snails, beetles, earwigs, grasshoppers, and ants, and seeds from bulrushes (*Scirpus* spp.) and cattails (*Typha* spp.) (Eddleman et al. 1994). Black rails in California are mostly resident, although there is some local movement from San Pablo Bay south to the southern San Francisco Bay (Evens et al. 1991). It is likely that the Sierra Nevada foothill population is resident throughout the year.

Loss and degradation of habitat due to water and flood-control projects, land-use changes, agriculture, and livestock grazing threaten the rail (Zeiner et al. 1990). Other threats include predation pressures from domestic cats, herons, egrets, and other predators, and from pollution carried by runoff into occupied marshes (Eddleman et al. 1994). It is

unlikely that California black rail occurs in the Project area due to the lack of expansive marshland habitats at Combie Reservoir.

### **Valley Elderberry Longhorn Beetle**

Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*) is endemic to the riparian areas of the Central Valley (Linsley and Chemsak 1972). VELB is a federally threatened species that is known to occur in association with its host plant, elderberry (*Sambucus* spp.) below about 900 meters (3,000 feet). Barr (1991) described the range of VELB to include all of the Central Valley from Shasta County in the north to Kern County in the south.

VELB utilize two species of elderberry: blue elderberry (*Sambucus mexicana*) and red elderberry (*Sambucus racemosa*) colonizing shrubs with a basal diameter greater than 2.5 cm (1 inch). VELB individuals rely on the same elderberry plant (or clump of plants) throughout their life cycle: adults feed on the elderberry leaves and flowers, mating pairs are typically observed on shrubs, eggs are laid on the stem or leaves, and the larval and pupal stages develop within the elderberry stem pith (Barr 1991).

Most remaining elderberry habitats exist in small isolated patches; consequently, the distances between VELB populations and unoccupied habitats limits this species' ability to successfully colonize new sites. Surveys for this species conducted by GANDA biologists in June 2008 found no elderberry plants in the Project area; therefore, VELB is also not present.

### **Brandegee's Clarkia**

Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeae*) is an annual herb that blooms from May through July. It is typically found in chaparral, cismontane woodlands, and often in road-cut areas between 73 and 915 meters above sea level. Brandegee's clarkia has no federal or state listing status, but is considered by the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants as a 1B.2 species (i.e., threatened in 20-80% of its occurrences; CNPS 2008).

Although this species is known from elsewhere in Nevada and Placer counties, it was not found during surveys of the Project area conducted by GANDA biologists in June 2008. The presence of this species in the Project area is considered to be unlikely due to the absence of plants or any evidence of fruiting bodies during the June 2008 survey; however, its presence cannot be definitively ruled without additional (protocol-level) surveys.

### **Stebbins's Morning Glory**

Stebbins's morning glory (*Calystegia stebbinsii*) is a perennial rhizomatous herb that blooms from April through July. It is typically found in chaparral openings and cismontane

woodlands on gabbroic or serpentinite soils between 185 and 730 meters above sea level. Stebbins's morning glory is listed as both federally and state endangered, and considered a CNPS list 1B.1 species (i.e., threatened in over 80% of its occurrences; CNPS 2008)

In Nevada County, Stebbins's morning glory is only known from locations with serpentinite soils (USFWS 2008b). This species was not present during surveys of the Project area conducted by GANDA biologists in June 2008, and is assumed not to occur in the Project area due to the lack of suitable habitat and soil types.

# REGULATORY SETTING

## Federal Regulations

### *Federal Regulation of Waters of the United States*

The U.S. Army Corps of Engineers (USACOE) and the Environmental Protection Agency (USEPA) regulate the discharge of dredged or fill material into Waters of the United States, including wetlands, under Section 404 of the Clean Water Act (CWA). Projects that would result in the placement of dredged or fill material into Waters of the U.S. require a Section 404 permit from the USACOE. Some classes of fill activities may be authorized under general permits if specific conditions are met; others will require individual permits.

Section 401 of the CWA requires the issuance of a water quality certification or waiver thereof for all Section 404 nationwide or individual permits issued by the Corps. The USEPA has deferred water quality certification authority to the Regional Water Quality Control Board (RWQCB).

The federal government also supports a policy of minimizing “the destruction, loss, or degradation of wetlands.” Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

### *Federal Endangered Species Act*

Sections 9 and 4(d) of the Endangered Species Act of 1973 (ESA) prohibit the “take<sup>1</sup>” of any fish or wildlife species listed as endangered or threatened, including the destruction of habitat that could hinder species recovery. Section 9 also prohibits the removal, possession, damage, or destruction of any endangered plant from federal land as well as acts to remove, cut, dig up, damage, or destroy an endangered plant species in non-federal areas in knowing violation of any state law or in the course of criminal trespass. As defined by the federal ESA, a threatened species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. An endangered species is any species that is in danger of extinction throughout all or a significant portion of its range. The provisions of the ESA are administered by the USFWS and National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries); the USFWS has jurisdiction over plants, wildlife, and resident fish, and NOAA Fisheries has jurisdiction over anadromous fish, marine fish, and marine mammals.

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<sup>1</sup> Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.

Section 7 of the Act mandates that all federal agencies consult with the USFWS and/or NOAA Fisheries to ensure that federal agencies' actions do not jeopardize the continued existence of a listed species or adversely modify critical habitat for listed species.

Section 10 of the ESA allows for take that is incidental to an otherwise lawful activity carried out by non-federal entities. An "incidental take" permit must be obtained from the USFWS or NOAA Fisheries prior to any public or private action that is likely to result in take of any individual of an endangered or threatened species. The permit requires preparation and implementation of a habitat conservation plan that would offset the take of listed species that may occur by providing for the overall preservation of the affected species through specific mitigation measures.

### ***Federal Migratory Bird Treaty Act***

The Migratory Bird Treaty Act states that without a permit issued by the U.S. Department of the Interior, it is unlawful to pursue, hunt, take, capture, or kill any migratory bird.

### ***Bald and Golden Eagle Protection Act***

The Bald and Golden Eagle Protection Act makes it illegal to import, export, take (which includes molest or disturb), sell, purchase, or barter any bald eagle (*Haliaeetus leucocephalus*) or golden eagle (*Aquila chrysaetos*) or part thereof.

## **State Regulations**

### ***State Regulation of Waters***

The CDFG regulates activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream. Section 1602 of the California Fish and Game Code (CFG) requires notification of the CDFG for lake or stream alteration activities. If, after notification is complete, the CDFG determines that the activity may substantially adversely affect an existing fish and wildlife resource, the CDFG has authority to issue a streambed alteration agreement under Section 1603 of the CFG. Requirements to protect the integrity of biological resources and water quality are often conditions of streambed alteration agreements. These may include avoidance or minimization of heavy equipment use within stream zones, limitations on work periods to avoid impacts to wildlife and fisheries resources, and measures to restore degraded sites or compensate for permanent habitat losses.

### ***California Endangered Species Act***

California implemented its own Endangered Species Act (CESA) in 1984. The CESA prohibits the take of state-listed endangered and threatened species; however, habitat destruction is not included in the state's definition of take. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote

conservation of these species. CDFG administers the CESA and authorizes take through Section 2081 agreements (except for designated “fully protected species”). Under the CESA, the terms threatened and endangered are defined as they are in the federal ESA, however these terms apply only to species or subspecies native to California. Unlike its federal counterpart, however, the CESA extends the take prohibitions to species petitioned for listing (i.e., state candidate species). State agencies are required to consult with CDFG to ensure that any actions undertaken are not likely to jeopardize the continued existence of any threatened or endangered species, or result in destruction or adverse modification of essential habitat.

California also designates Species of Special Concern, which are those species experiencing serious population declines or range retractions that, if continued, could qualify them for State threatened or endangered status. Although this is an administrative designation that carries no formal legal status, the intent of the designation is to focus attention on the conservation risk, to stimulate research on poorly known species, and to achieve conservation and recovery of these species before they meet CESA criteria for listing as threatened or endangered. As such, Species of Special Concern are considered during the environmental review process as described in Section 15380 of the CEQA Guidelines.

Regarding listed rare and endangered plant species, CESA defers to the California Native Plant Protection Act (NPPA) of 1977, which prohibits importing of rare and endangered plants into California, and the taking and selling of rare and endangered plants. The CESA includes an additional listing category for threatened plants, which are not regulated under the NPPA. In this case, plants listed as rare or endangered under the NPPA are not protected under CESA but can be protected under CEQA. In addition, plants that are not state-listed but meet the state standards for listing are also protected under CEQA (Guidelines, Section 15380). In practice, this is generally interpreted to mean that all species on lists 1B and 2 of the CNPS Inventory (Tibor 2001) potentially qualify for protection under CEQA, and some species on lists 3 and 4 of the CNPS Inventory may qualify for protection under CEQA. List 3 includes plants for which more information is needed on taxonomy or distribution. Some of these are rare and endangered enough to qualify for protection under CEQA. List 4 includes plants of limited distribution that may qualify for protection if their abundance and distribution characteristics are found to meet the state standards for listing.

### ***California Fish and Game Code Bird Protections***

Section 3503 of the CFGC prohibits destruction of the nests or eggs of most native resident and migratory bird species. Section 3503.5 of the CFGC specifically prohibits the taking of raptors or destruction of their nests or eggs.

## **Regional Conservation Plans**

Environmental review and permitting on a project-by-project basis is being increasingly accomplished using Natural Community Conservation Plans (NCCPs) and Habitat Conservation Plans (HCPs). These programs are essentially streamlined listed species take permitting processes, but they effectively allow for a landscape-scale, ecosystem-based approach to conservation planning on a regional scale. The Natural Communities Conservation Planning process is authorized and codified in Section 2800 of the California Fish and Game Code. The goal of Natural Communities Conservation Planning is to conserve healthy functioning ecosystems and the species that are supported by them. Habitat Conservation Plans are required under the Federal Endangered Species Act as part of the Section 10(a) Incidental Take Permit provision. The HCP standards are to fully mitigate for impacts and must not jeopardize the continued existence of listed species. Nevada County currently has no approved HCP or NCCP in place; however, Placer County is developing a joint HCP/NCCP covering the western portion of Placer County.

### ***Placer County Conservation Plan (PCCP)***

As part of the Placer Legacy Program, Placer County has initiated preparation of a joint NCCP/HCP to comply with the State and Federal Endangered Species Act, and an effort to programmatically comply with the Federal Clean Water Act related to wetlands. This effort, referred to as the Placer County Conservation Plan (PCCP), is proceeding for the first phase of the PCCP covering Western Placer County (i.e., Phase 1). Phase 1 is intended to address the impacts associated primarily with unincorporated growth and development near cities such as Roseville, Rocklin, and Lincoln. Subsequent phases (Phases 2 and 3) of the PCCP will address eastern and central portions of the county where growth and development are slower and conservation needs less urgent. Combie Reservoir and the Project area are located near the eastern boundary of the Phase 1 jurisdiction.

Although the PCCP has not yet been adopted, an administrative draft is currently available (Placer County 2005). The PCCP uses Wildlife Habitat Relations (WHRs; Ziener et al. 1990) to classify land cover types and define conservation strategies and best management practices within these areas. Using the WHR scheme, the Project area would be primarily classified as a (lacustrine) Aquatic and Wetland Ecosystem. Although the impoundment and creation of reservoirs is generally viewed as alteration of a natural lotic ecosystem and replacement with artificial lacustrine ecosystem, small patches of Freshwater Emergent Wetlands (FEWs) may be associated with this WHR (e.g., around the reservoir and pond margins). The PCCP lists necessary management actions for aquatic and wetland conservation as well as best management practices to be implemented within this WHR. Operations of the proposed Project are expected to comply with the relevant management actions and BMPs defined in the forthcoming PCCP.

## Entitlements

All permits for this Project will be requested by and issued to NID; therefore, NID will serve as the lead agency pursuant to CEQA. The United States Geological Survey (USGS) will serve as one of the Project partners and will be the agency responsible for monitoring water-quality impacts and project outcomes. Permitting agencies and the respective authorizations that are anticipated for this Project are listed below.

1. Sacramento Regional Water Quality Control Board – Waste Discharge Permit and 401 Certification or Waiver
2. CDFG – Section 1603 Stream Alteration Agreement
3. USACOE – Section 404 Permit for Discharge of Dredged or Fill Material into Waters of the United States
4. Placer County – Hazardous Materials Permit
5. California Air Resources Board – Portable Equipment Registration Program

# PROJECT IMPACTS AND MITIGATION MEASURES

## Significance Criteria and Assumptions under CEQA

According to CEQA Guidelines, biological impacts would be significant if the Project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any plant or wildlife species identified as endangered, threatened, candidate, sensitive, or special-status by the USFWS or CDFG, CEQA, or the California Native Plant Society (CNPS) or in local or regional plans, policies or regulations, or;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified by the USFWS or CDFG or in local or regional plans, policies, or regulations;
- Have a substantial adverse effect on federally protected wetlands or other Waters of the U.S as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan;
- Conflict with the following federal and state laws and regulations:
  - The Migratory Bird Treaty Act;
  - California Fish and Game Code Sections 3503 and 3503.5, which protect nesting birds and raptors;
  - California Fish and Game Code Section 1600 protections for fish and wildlife associated with streambed alteration activities; or

As part of the CEQA Initial Study, the effects of the Project are classified with respect to the above criteria (a-h) as having: 1) “no impact;” 2) “less than significant impact;” 3) “less than significant impact with mitigation measures;” or 4) “potentially significant impact.” “No Impact” applies where there is no evidence of Project impacts. A “Less Than Significant Impact” applies where the Project’s impacts will be insubstantial and will not require any mitigation to reduce impacts. “Less Than Significant with Mitigation Measures” applies where the incorporation of mitigation measures will reduce an effect

from “Potentially Significant Impact” to a “Less than Significant Impact.” A “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.

Additional information on determining the significance of the environmental effects caused by projects is provided in Sections 15063 through 15065 of the CEQA Guidelines. The above criteria are addressed within the Checklist section of the formal CEQA Initial Study document prepared by NID (NID 2008), and are also discussed below in the context of potential impacts to fishes, herpetofauna, wildlife, and plants (see Biological Resource Impacts section).

### **Assumptions**

The primary purpose of the CEQA Initial Study for this Project is to document the environmental impacts associated with the resumed dredging program as integrated with the mercury extraction technology. It is assumed that the removal of elemental mercury from the reservoir will have a decidedly positive effect on biological resources and overall water quality. Because the CRWQCB, CDFG, USACOE, and USFWS all require environmental documentation in order to re-issue their various permits to allow dredging operations in the reservoir to resume as part of this Project, the Initial Study is focused on demonstrating that such permit requirements are met, as well as addressing any Project impacts associated with the resumed dredging operation.

## **BIOLOGICAL RESOURCE IMPACTS AND MITIGATION MEASURES**

The following section is organized according to the CEQA Guidelines Appendix G checklist for biological resources. An abbreviated list of species to be considered in this discussion was developed using the results of the USFWS and CNDDDB special-status species queries along with professional judgment regarding the potential for these and various other species to occur within the Project area, including information gathered during reconnaissance-level surveys conducted by GANDA biologists, and any other available sources of information (e.g., previous fish population sampling, etc.). Mitigation measures and recommendations are also discussed as relevant.

***Special-Status Species Impacts*** – *Will the Project have a substantial adverse effect, either directly or through habitat modifications, on any plant or wildlife species identified as endangered, threatened, candidate, sensitive, or special-status by the USFWS or CDFG, CEQA, or the California Native Plant Society (CNPS) or in local or regional plans, policies or regulations?*

Special-status species that may potentially occur in the Project area include hardhead (*Mylopharodon conocephalus*), northwestern pond turtle (*Actinemys marmorata marmorata*), California red-legged frog (*Rana aurora draytonii*), bald eagle (*Haliaeetus leucocephalus*),

California black rail (*Laterallus jamaicensis coturniculus*) and Brandegee's clarkia (*Clarkia bioloba* ssp. *brandegeeeae*). Potential impacts to these species are discussed below along with recommended avoidance/minimization measures where appropriate.

### **Hardhead**

The presence of hardhead (*Mylopharodon conocephalus*) in the reservoir is unknown, but its potential is reduced by the abundance of introduced predators, particularly centrarchid basses. This native minnow, a California Species of Special Concern (SSC), prefers deep pools in undisturbed riverine environments, but can persist in some reservoirs. Project operations are not anticipated to adversely affect hardhead (if they are indeed present) because hardhead are not likely to occur in the open non-vegetated shallows of the delta fan area where dredging activities will occur. All fish should be easily able to avoid the area of locally active dredging during Project operations. Adult hardhead would reside in deeper water (i.e., hypolimnetic) portions of the reservoir, and any juveniles, if present, would utilize marginal habitats on the edge of the littoral zone in order to avoid introduced predators. Adult hardhead typically move upstream to spawn in riverine habitats during April or May and young-of-the-year fish may remain in the river indefinitely. Because hardhead are unlikely to be affected if present, any impacts would at most be less than significant; no mitigation is necessary. Thus, no mitigation measures are proposed beyond those which may be required as part of permit authorizations, such as those that may be contained in any Section 1603 Streambed Alteration Agreement issued for this Project.

### **Northwestern Pond Turtle (NWPT)**

NWPT (*Actinemys marmorata marmorata*), a California Species of Special Concern (SSC), are known to occur in the Project area. Indeed, NWPT were observed in the reservoir and pond during reconnaissance-level surveys in April 2008. For most of the year, NWPT prefer sunny south-facing shorelines with adequate basking sites such as emerging logs or boulders; Project operations will not significantly affect these shoreline areas. However, NWPT could be affected by Project operations if overwintering habitats (e.g., reservoir bottom muds, upland areas containing leaf or needle litter) or nesting habitats (i.e., fine upland substrates such as sand, silt, clay) are disturbed during Project operations. It is unlikely that NWPT would use the levee road and fill areas that comprise the upland portion of the Project area for overwintering or oviposition (egg laying), although they may periodically travel across these areas. Direct effects to NWPT could include disturbance of bottom overwintering substrates or mortality from trampling by workers or equipment (e.g., during turtle movements to and from wintering, breeding, and summering habitats). Implementation of Mitigation Measures listed below for this species should reduce any impacts to a less than significant level.

**NWPT Mitigation Measures:**

**MM VI-a1.** Because NWPT may overwinter in reservoir bottom muds, timing of dredging operations should occur outside their wintering period (NWPT generally overwinter from November-March).

**MM VI-a2.** Project personnel should implement precautions (e.g., awareness training, low speed limits, and inspection of vehicles and other equipment prior to operation) to avoid turtle mortality associated with Project activities.

**MM VI-a3.** A worker education program should be provided in order to reduce the potential for uninformed workers to unintentionally or intentionally harass, injure, or kill NWPT individuals.

**MM VI-a4.** Relocation of any NWPT individuals found in the work zone would help minimize injury or mortality, although such an action would need to be performed by a permitted biologist.

***California Red-legged Frog (CRLF)***

The California red-legged frog (CRLF; *Rana aurora draytonii*) is a federally threatened and state SSC amphibian species that may possibly occur in the Project area. The Project Area is located within the historical and current potential range of this species; however it is not within designated CRLF critical habitat. No CRLF records are listed for the Lake Combie quadrangle; however, CRFL is on the USFWS special-status species list for this area due to the presence of several designated critical and non-critical habitat sections in other parts of Nevada and Placer counties. These habitat areas are approximately 30-40 kilometers from the Project area. CNDDDB records indicate that the closest CRLF occurrences are several quadrangle areas away (in the Michigan Bluff and North Bloomfield quads).

The probability of CRLF occurring in the Project area is considered low for several reasons, none of which can definitively rule out their presence. The nearest known CRLF records are approximately 25 kilometers away, much farther than the known maximum dispersal distance of 3 km (Bulger et. al. 2003; Fellers and Kleeman 2007). Even so, CRLF could occur at unknown locations in unsurveyed but otherwise suitable habitat closer to the Project area. Secondly, CRLF does not generally occur in large reservoirs, although they can (Storer 1925), and adult stages are known from Jamieson Reservoir on the Santa Ynez River (USFWS 2002). Third, and probably most unfavorable for CRLF occurrence at Combie Reservoir, is the presence of introduced predators such as centrarchid fishes (largemouth and spotted bass) and bullfrogs (*Rana catesbeiana*) which are known to occur in the reservoir and quarry ponds within the Project Area. While the presence of predators like basses and bullfrogs does not completely preclude CRLF, it greatly reduces their likelihood. Finally, the Project area has only very sparse emergent vegetation preferred by CRLF for oviposition and cover from predators; however, aquatic vegetation is not a prerequisite for successful breeding by this species.

In order to rule out CRLF presence in the Combie Reservoir Project area, protocol-level surveys are required. In 2005, the USFWS determined that the survey portion of its 1997 guidelines (USFWS 1997) were less likely to accurately detect CRLF than previously thought - especially in portions of the species' range where they exist in low numbers - and the USFWS subsequently issued a more intensive survey protocol (USFWS 2005). Now, habitats within a 1.6-kilometer (1-mile) radius of project areas must be considered in addition to the immediate work site.

Prior to conducting protocol surveys for CRLF, a site assessment must be completed and submitted to the USFWS for approval (a procedure that may take weeks to get a ruling). A USFWS-approved surveyor first must determine if there are reported occurrences of CRLF within a 1.6-kilometer (1-mile) radius of the project site using CNDDDB and other resources (e.g., local residents, amateur herpetologists, resource managers and biologists from municipal, State, and Federal agencies, environmental groups, and herpetologists at museums and universities) because information within CNDDDB is not always current, nor do all surveyors submit reports to CNDDDB. Then, to properly characterize the habitat within 1.6 kilometers (1 mile) of the project site, individuals conducting site assessments must visit the project site and as much of the surrounding habitat within 1.6 kilometers (1 mile) of the project site as possible. The aquatic habitats should be mapped and characterized (e.g., ponds vs. creeks, pool vs. riffle, ephemeral vs. permanent [if ephemeral, give date it goes dry], vegetation [type, emergent, overhanging], water depth at the time of the site assessment, bank full depth, stream gradient [percent slope], substrate, and description of bank). The presence of bullfrogs and other aquatic predators such as centrarchid fishes should be documented even though their presence does not preclude the presence of CRLF. Upland habitats should be characterized by including a description of upland vegetation communities, land uses, and any potential barriers to CRLF movement. A cursory examination of habitats adjacent to the Project area during the April 2008 site visit revealed the presence of potential CRLF habitat at several natural and man-made ponds within one mile of the work site.

Based on the information provided in the site assessment report, the USFWS provides guidance on how CRLF issues should be addressed, including whether field surveys are appropriate, where the field surveys should be conducted, and whether incidental take authorization should be obtained through Section 7 consultation or a Section 10 permit pursuant to the Endangered Species Act (USFWS 2005).

The 2005 USFWS protocol (USFWS 2005) requires up to eight surveys for CRLF. Negative findings are evidence that CRLF are not present and these findings are considered valid for a period of two years. Surveys may begin anytime during January (April 15th at higher elevations; there is some discretion here depending on local breeding chronology) and should be completed by the end of September. Multiple survey visits conducted throughout the survey-year (January through September) increases the likelihood of

detecting the various life stages of the CRLF. For example, adult frogs are most likely to be detected at night between January 1 and June 30, somewhere in the vicinity of a breeding location, whereas, sub-adults are most easily detected during the day from July 1 through September 30. The USFWS survey guidelines recommend “a total of up to eight (8) surveys to determine the presence of CRLF at or near a project site (no additional surveys are required if any CRLF life stage is detected before 8 surveys are completed). Two (2) day surveys and four (4) night surveys are recommended during the breeding season; one (1) day and one (1) night survey is recommended during the non-breeding season. Each survey must take place at least seven (7) days apart. At least one survey must be conducted prior to August 15th. The survey period must be over a minimum period of 6 weeks (i.e., the time between the first and last survey must be at least 6 weeks). Throughout the species’ range, the non-breeding season is defined as between July 1 and September 30.”

Recently, staff from the USFWS California-Nevada Operations Office, U.S. Army Corps of Engineers South Pacific Division, and National Marine Fisheries Service (NMFS) Southwest Region jointly developed procedural guidelines to ensure that certain proposed actions will not likely adversely affect 66 listed species, including CRLF (USACOE 2006). In order to receive NLAA (not likely to adversely affect) determinations through the following criteria, the analysis of an Action Area for these projects must include the full scope of direct and indirect effects to the species anticipated from the proposed action.

Effects to CRLF are considered under these guidelines if:

*The project’s Action Area is within the known range of the species, it encompasses suitable CRLF habitat components, and any of the three following conditions exist: 1) it has been documented that the Action Area, or an area within a one mile (1.6 km) radius of the Action Area, currently supports CRLF; 2) there are documented records of historical occurrence within the Action Area; or 3) the Action Area has not been surveyed to determine frog presence using Service [USFWS]-approved survey protocols.*

*NLAA determination:*

*(a) A NLAA determination cannot be made for projects that will occur within habitat known to contain a population of CRLF.*

*(b) All ‘in-water’ construction related activities will occur outside the CRLF’s breeding season. For the purposes of this consultation, this season is generally December through May, dependent on rainfall.*

*(c) Pre- construction surveys for CRLF will be conducted prior to and during construction activities and, if frogs are observed, all construction is halted until consultation with the Service is completed and it can be determined that frogs will not be adversely affected, and*

*(d) All stream contours impacted by project related activities are returned to their original condition within one construction season, unless consultation with the Service has determined that it is not beneficial to the species or feasible to do so, and*

*(e) All areas impacted by project related activities are revegetated with an appropriate assemblage of native riparian wetland and upland vegetation suitable for the area. A species list and restoration and monitoring plan shall be included with the project proposal for review and approval by the Service and the Corps. Such a plan must include, but not be limited to, location of the restoration, species to be used, restoration techniques, time of year the work will be done, identifiable success criteria for completion, and remedial actions if the success criteria are not achieved, and*

*(f) There will be no rip-rap or similar permanent bank stabilization materials placed in suitable CRLF habitats, and*

*(g) No pesticides (e.g., insecticides, herbicides) or other toxic compounds will be applied within 250 feet of any suitable CRLF aquatic habitat, or beyond the 250 foot buffer in such a manner that they could drift or otherwise move into the aquatic habitat.*

*No Effect determination may be supported:*

*(a) The Action Area is not within the known range of the species, has been surveyed using Service-approved protocols and no frogs were detected, or the Service has determined that surveys were not necessary, or*

*(b) The Action Area is within the known range of the species, and has either 1) been surveyed using Service-approved protocols and no frogs were detected or 2) there are no records of historical occurrence within the Action Area and no suitable CRLF habitat (aquatic or terrestrial) will be affected by any project activity.*

A formal CRLF Site Assessment of the Project Area was conducted in 2008 following the procedures outlined in USFWS (2005). All potential CRLF habitats within a 1.6-km radius surrounding the Project Area were visited, photographed, and assessed in terms of the quality of potential CRLF breeding and estivation habitat. This Site Assessment identified 31 aquatic features providing potential CRLF habitat within this 1.6-km radius (see GANDA 2009 for additional details). Queries of the California Natural Diversity Database (CNDDDB; CDFG 2008) and HerpNet museum specimen records (herpnet.org) identified no known records of CRLF occurring within 1.6 km of the Project Area. However, 22 of

the 31 sites identified as potential CRLF habitat in the vicinity of the Project (71%) are located on private property. Based on the results of the CRLF Site Assessment, the USFWS has initially indicated that, without adequate access for protocol-level population surveys within the majority of this 1.6-km radius, the presence of CRLF in the overall Project Area will likely have to be assumed (i.e., CRLF presence cannot be ruled out for privately owned areas that are not able to be surveyed).

If the USFWS indeed directs that CRLF presence must be assumed, or if CRLF are found in or near the Project Area, the potential would exist for indirect impacts to habitat and for direct impacts to adults, sub-adults, tadpoles, and eggs in the footprint of the Project. Potential indirect impacts may include the loss of alluvium and the shallow water at the dredging site) and/or the potential loss of riparian or emergent aquatic habitats during dredging or other Project operations. Direct impacts could include injury or mortality to CRLF from being crushed by equipment and worker foot traffic. Work activities, including noise and vibration, may harass CRLF by causing them to move, increasing potential for predation and desiccation. Tadpoles may be entrained by pump intakes, and dredging and filtration work could cause unusually high levels of siltation. Such siltation could smother eggs and reduce overall habitat quality (although existing breeding and nursery habitats in the reservoir and former dredge pond areas are poor to marginal at best; thus CRLF breeding is considered unlikely in the immediate Project Area). Implementation of the Mitigation Measures listed below for this species should reduce any impacts to a less than significant level.

**CRLF Mitigation Measures:**

**MM VI-a5.** Protocol-level CRLF surveys of all accessible sites within the 1.6-km radius of the Project Area should be conducted following USFWS guidelines (USFWS 2005) prior to Project operations. If CRLF are determined to be present as a result of these surveys, or if CRLF presence is assumed, Mitigation Measures VI-a6 through –a11 (below) should be implemented to reduce any impacts to a less than significant level.

**MM VI-a6.** The boundaries of the Project area and equipment access routes should be minimized and clearly demarcated, and work areas should be located outside of riparian areas and other water bodies.

**MM VI-a7.** Best management practices should be implemented to confine the area to be disturbed to the minimum necessary.

**MM VI-a8.** Work activities in or near breeding areas should be avoided during the breeding season (approximately November-June) to reduce potential adverse impacts, particularly to eggs and tadpoles.

**MM VI-a9.** CRLF individuals found in the work zone should be relocated to minimize injury or mortality; however, such an action would need to be performed by a permitted biologist to minimize any unintended negative consequences of improper handling.

**MM VI-a10.** A worker education program should be provided; the potential for uninformed workers to unintentionally or intentionally harass, injure, or kill CRLF could be greatly reduced by informing workers of the presence and protected status of this species and the measures that are being implemented to protect it during Project operations.

**MM VI-a11.** Consultation with USFWS should be sought to identify any additional required authorizations and implement any specified avoidance and minimization measures for CRLF.

### ***Bald Eagle***

Bald eagle (*Haliaeetus leucocephalus*) is a federally delisted and state endangered species that may occur at Combie Reservoir. While foraging and possibly nesting habitat for bald eagle exists at Combie Reservoir, no birds or nests were observed during reconnaissance-level surveys in April 2008, or nesting surveys conducted in 2009. It is possible that the reservoir is used by wintering eagles or eagles nesting close by for foraging; however, the large number of residences populating the shoreline and surrounding area may preclude nesting for eagles that typically choose secluded nesting sites (although this habitat requirement may be less important than previously thought because in recent years eagles have colonized more disturbed areas). Additionally, large trees preferred as nest sites are not within close proximity to the Project area. Project operations would not likely impact foraging eagles because activities would be concentrated in a small portion of the reservoir, sedimentation would be confined behind turbidity curtains, and mercury will be removed from the system. Implementation of the Mitigation Measures listed below for this species should reduce any impacts to a less than significant level.

#### **Bald Eagle Mitigation Measures:**

**MM IV-a12.** Protocol-level bald-eagle nesting surveys should be performed during each year of Project operations following CDFG guidelines (Jackman and Jenkins 2004). If such surveys confirm the absence of this species, the Project will have no impacts on this species and no mitigation is necessary. If such surveys establish the presence of eagles nesting near the Project area, implementation of Mitigation Measures IV-a13 and -a14 (below) would ensure that any potential impacts are less than significant for this species.

**MM IV-a13.** Dredging and other operational activities that could potentially disturb eagles should occur no closer than 200 meters (660 feet) from any bald eagle nesting site.

**MM IV-a14.** Work activities near active nests should occur outside the bald eagle breeding season or limited operating period (LOP). The LOP in northern California is typically 1 January to 1 August.

### **California Black Rail**

The California black rail (*Laterallus jamaicensis coturniculus*) is a state threatened and fully protected species. A very small rail about the size of a sparrow, the black rail inhabits densely vegetated saltwater, brackish, and freshwater marshes and wetlands. The closest known black rail occurrences to Combie Reservoir include an undisclosed location near Grass Valley (over 30 km away) and the Spenceville Wildlife Area (approximately 25 km away) near Beale Air Force Base (CNDDDB 2008). Black rails in the Sierra Nevada foothills are found primarily in extensive marshes dominated by tules and/or cattails, and require water depths less than 3 cm (1.2 in) for breeding. Because no extensive marsh habitat occurs in or adjacent to Combie Reservoir, it is extremely unlikely that California black rail occurs in the Project area. Therefore, no impacts to this species are anticipated and no mitigation is necessary.

### **Brandegee's clarkia**

Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeae*) is an annual herb that blooms from May through July. It is typically found in chaparral, cismontane woodlands, and often in road-cut areas between 73 and 915 meters above sea level. Brandegee's clarkia has no federal or state listing status, but is considered by the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants as a 1B.2 species; generally, CNPS list 1B and list 2 species qualify for protection under CEQA. Botanical surveys targeting Brandegee's clarkia that were conducted in 2008 and 2009 confirm the absence of this species in the immediate Project Area (i.e., the levee road and fill areas that comprise the terrestrial footprint of the Project); however, this species was observed on the west-facing hillslope to the east of Retherford Road (immediately adjacent to the Project Area). Potential colonization of the Project Area by this species is considered unlikely due to the lack of preferred habitat along the levee road and fill areas. Thus, Project operations are not likely to affect Brandegee's clarkia. Implementation of the Mitigation Measures listed below for this species should reduce any potential impacts to a less than significant level.

#### **Brandegee's clarkia Mitigation Measures:**

**MM IV-a15.** Annual protocol-level surveys for Brandegee's clarkia should be conducted during each year of Project operation. If protocol-level surveys confirm the continued absence of this species, the Project will have no impacts and no mitigation is necessary. If such surveys establish the presence of Brandegee's clarkia in the Project area, implementation of the Mitigation Measures MM IV-a16 through -a18 (below) would ensure that any potential impacts would be less than significant for this species.

**MM IV-a16.** Habitat occupied by Brandegee's clarkia should be protected by establishing an exclusion zone around the perimeter of such habitat where feasible. The exclusion zone should be temporarily fenced or staked and flagged in the field by a trained professional botanist. Project infrastructure and activities (i.e., staging areas, equipment access routes, etc.) will be located outside of this exclusion zone.

**MM IVa-17.** Activities should be restricted to the dry season, and the flowering period for this species (approximately May-June) should be avoided if possible.

**MM IVa-18.** All known locations of Brandegee's clarkia in the Project area should be monitored during Project operations to assess the effectiveness of protection measures.

***Riparian Habitat and Sensitive Community Impacts – Will the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified by the USFWS or CDFG or in local or regional plans, policies, or regulations?***

The Project area contains approximately 1,000 meters of riparian area along the levee road separating the reservoir/pond from the Bear River, as well as approximately 2,500 meters of reservoir/pond shoreline. With the exception of the levee road and a small portion of the reservoir shoreline adjacent to the area to be dredged, these riparian areas will not be disturbed or otherwise affected by Project operations. The Placer County Conservation Plan (PCCP) classifies land coverage using Wildlife Habitat Relations (WHR). Using this scheme, the Project area would be primarily characterized as a lacustrine Aquatic and Wetland Ecosystem. Although the impoundment and creation of reservoirs is generally viewed as alteration of a natural lotic ecosystem and replacement with artificial lacustrine ecosystem, patches of Freshwater Emergent Wetlands (FEWs) may occur in association with this WHR (e.g., around the reservoir and pond margins). FEWs are known to be one of the more productive wildlife habitats providing food, cover, and water for numerous species. Project operations will not adversely affect any FEW communities; indeed, is it assumed that the removal of elemental mercury from the system as part of this Project will have a decidedly positive effect on aquatic habitats and overall water quality.

There will be three to four anchor points for the cable/pulley maneuvering system for the electric dredge. Two points will be on shore with a cable running between them and the others will be submerged. A pulley or winch connected to a cable will provide guidance for the dredge path of travel. The shore-mounted anchor system will be located such that there will be minimal disturbance to riparian vegetation. Cables can be anchored to existing trees or posts with sufficient protective wrapping to avoid any damage. Alternatively, temporary anchor points can be placed in upland areas without any impacts to riparian vegetation or habitat. When the dredge is to be re-positioned, it will be able to move without relocating the shore-mounted anchors as it could merely realign its path along the pulley and cable system between the two shore-mounted anchors. If the dredge path necessitates relocation or re-positioning of the anchors, it would be done such that disturbance to riparian vegetation is avoided or minimized. In addition, the shoreline location where the slurry pipe will cross the riparian area between the reservoir and the upland levee road will be selected such that disturbance to riparian vegetation is minimized by the placement of the pipe. Given the site conditions at the proposed location, the above-ground placement of this pipe over rock or earthen portions of the levee should be possible without harming any vegetation. In general, the robust and

prolific nature of the riparian vegetation in the Project Area should allow for minor disturbances to be restored naturally through seasonal re-growth. Therefore, Project impacts to riparian areas are anticipated to be less than significant, and no mitigation is necessary.

***Protected Wetland Impacts – Will the Project have a substantial adverse effect on federally protected wetlands or other Waters of the U.S as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means?***

Combie Reservoir is an artificial, man-made surface-water impoundment. The Project area boundary encompasses primarily inundated portions of the reservoir and pond littoral and shorelines zones, plus some upland levee and fill areas. As such the Project area includes both waters of the US and wetlands as defined by Section 404 of the Clean Water Act. Acquisition of a Section 404 permit from the USACOE may be required to conduct dredging operations as part of this Project, thus proposed operations will be subject to agency review and consultation. Other than the dredging area at the bottom of the reservoir near the delta fan, habitat structure in the reservoir and pond will not be affected (i.e., material will only be removed from the delta). No riparian or wetland areas will be disturbed (with the exception of the above-ground slurry pipe crossing and dredge anchor points mentioned above). Water quality in reservoir and pond areas will be affected (e.g., pond containment areas may become turbid during operations); however, it is assumed that the removal of elemental mercury will have a decidedly positive net effect on biota, habitat resources, and overall water quality in the Project area. Therefore, Project impacts to wetland areas are anticipated to be less than significant, and no mitigation is necessary beyond that which may be required as part of permit authorizations.

***Migratory Species Impacts – Will the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?***

Project operations and infrastructure will not impede the movement of any migratory fish or wildlife species. Access to upstream portions of the Bear River and downstream portions of the reservoir will not be affected by Project operations. The inundated portions of the reservoir and pond, and the small amount of upland levee road and fill area that will be affected by Project operations are not suitable for bird nesting. Therefore no impacts are anticipated and no mitigation is necessary.

***Local Ordinance Conflicts – Will the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?***

Although there are no specific ordinances regarding mosquito abatement in the area, the Placer Mosquito and Vector Control District endorses policies and implements programs

to control or eliminate existing mosquito breeding sources, and to prevent new mosquito breeding sources for the protection of public health and comfort. Nevada County does not have a mosquito abatement district; however, Nevada County's Agricultural and Environmental Health Departments have an active mosquito treatment program and the Public Health Department provides mosquito and West Nile virus education programs. This Project may introduce new surface water only in the small containment area surrounding the dewatering and mercury removal equipment. This containment area will be inspected daily during operations; any visible standing water that remains after 72 hours will be pumped into the primary tanks for agitation, making it unsuitable for mosquito breeding (i.e., the mosquito life cycle requires longer-standing stagnant water for larval development). Thus, the Project will not introduce any suitable waters for mosquito breeding.

No other local policies or ordinances protecting biological resources are applicable to this Project (e.g., no trees are to be removed or otherwise harmed as part of the Project). Therefore, no conflicts with such policies are anticipated and no mitigation is necessary.

***HCP/NCCP Conflicts*** – *Will the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

Placer County is in the process of developing a joint HCP/NCCP for the western portion of the county that includes the Project area, referred to as the Placer County Conservation Plan (PCCP). Nevada County had no such conservation plan in place. Although the PCCP is not yet adopted, it will define necessary management actions for aquatic and wetland conservation as well as best management practices to be implemented within these areas. No conflicts with any provisions of the forthcoming PCCP are anticipated for this Project, and no mitigation is necessary.

***MBTA and CDFG Code Conflicts*** – *Will the Project conflict with the Migratory Bird Treaty Act, CFGC Sections 3503 and 3503.5 protections for nesting birds and raptors; or CFGC Section 1600 protections for fish and wildlife associated with streambed alteration activities?*

The Project will primarily affect inundated portions of the reservoir and pond, plus the small amount of upland levee road and fill area where the sediment basin and mercury extraction equipment will be located. No conflicts with the Migratory Bird Treaty Act or CFGC Sections 3505 and 3503.5 nesting bird protections are anticipated. A Section 1603 Streambed Alteration Agreement will be required for this Project, thus Project operations will be subject to agency review and consultation. As such, Project operations will comply with all conditions of this authorization, and no conflicts with state or federal regulations protecting birds, fish, and wildlife are anticipated; therefore no mitigation is necessary.

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**Appendix A:**  
**USFWS special-status species records for the Lake Combie quadrangle**

*Federal Endangered and Threatened Species that Occur in  
or may be Affected by Projects in the Counties and/or  
U.S.G.S. 7 1/2 Minute Quads you requested*  
**Document Number: 080612050224**  
**Database Last Updated: January 31, 2008**

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*Quad Lists*

**Listed Species**

**Invertebrates**

- *Desmocerus californicus dimorphus*
  - valley elderberry longhorn beetle (T)

**Fish**

- *Hypomesus transpacificus*
  - delta smelt (T)
- *Oncorhynchus mykiss*
  - Central Valley steelhead (T) (NMFS)
- *Oncorhynchus tshawytscha*
  - Central Valley spring-run chinook salmon (T) (NMFS)
  - winter-run chinook salmon, Sacramento River (E) (NMFS)

**Amphibians**

- *Rana aurora draytonii*
  - California red-legged frog (T)

**Plants**

- *Calystegia stebbinsii*
  - Stebbins's morning-glory (E)

**Quads Containing Listed, Proposed or Candidate Species:**

LAKE COMBIE (542D)

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*County Lists*

No county species lists requested.

**Key:**

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.

- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the [National Oceanic & Atmospheric Administration Fisheries Service](#). Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

### *Important Information About Your Species List*

#### **How We Make Species Lists**

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, or may be affected by projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

#### **Plants**

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online [Inventory of Rare and Endangered Plants](#).

#### **Surveying**

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the [Guidelines for Conducting and Reporting Botanical Inventories](#). The results of your surveys should be published in any environmental documents prepared for your project.

#### **Your Responsibilities Under the Endangered Species Act**

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

### **Take incidental to an otherwise lawful activity may be authorized by one of two procedures:**

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal [consultation](#) with the Service.
- During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.
- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.
- Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

### **Critical Habitat**

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as [critical habitat](#). These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our [critical habitat page](#) for maps.

### **Candidate Species**

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

### **Species of Concern**

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern.

However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. [More info](#)

### **Wetlands**

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

### **Updates**

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be September 10, 2008.

**Appendix B:**  
**CNDDDB special-status species records for the Lake Combie quadrangle**

Actinemys marmorata marmorata

northwestern pond turtle

Element Code: ARAAD02031

\_\_\_\_\_ Status \_\_\_\_\_ NDDB Element Ranks \_\_\_\_\_ Other Lists \_\_\_\_\_

Federal: None

Global: G3G4T3

CDFG Status: SC

State: None

State: S3

\_\_\_\_\_ Habitat Associations \_\_\_\_\_

**General:** ASSOCIATED WITH PERMANENT OR NEARLY PERMANENT WATER IN A WIDE VARIETY OF HABITATS.

**Micro:** REQUIRES BASKING SITES. NESTS SITES MAY BE FOUND UP TO 0.5 KM FROM WATER.

Occurrence No. 67

Map Index: 32843

EO Index: 9232

\_\_\_\_\_ Dates Last Seen \_\_\_\_\_

Occ Rank: Unknown

Element: 1988-08-18

Origin: Natural/Native occurrence

Site: 1988-08-18

Presence: Presumed Extant

Trend: Unknown

Record Last Updated: 1996-02-23

**Quad Summary:** Lake Combie (3912111/542D)

**County Summary:** Nevada

**Lat/Long:** 39.05732° / -121.09198°

**Township:** 14N

**UTM:** Zone-10 N4324870 E665091

**Range:** 08E

**Mapping Precision:** NON-SPECIFIC

**Section:** 21 **Qtr:** XX

**Symbol Type:** POLYGON

**Meridian:** M

**Area:**

**Elevation:** 1,260 ft

**Location:** WOLF CREEK ABOVE WOLF ROAD; NORTHWEST OF LAKE OF THE PINES.

**Location Detail:**

**Ecological:**

**Threat:**

**General:** 4 CAPTURED, 1 RELEASED AND 3 RETAINED BY D.C. HOLLAND ON 18 AUGUST 1988.

**Owner/Manager:** UNKNOWN

Clarkia biloba ssp. brandegeae

Brandegee's clarkia

Element Code: PDONA05053

----- Status ----- NDDB Element Ranks ----- Other Lists -----

Federal: None

Global: G4G5T2

CNPS List: 1B.2

State: None

State: S2.2

----- Habitat Associations -----

General: CHAPARRAL, CISMONTANE WOODLAND.

Micro: OFTEN IN ROADCUTS. 295-885M.

Occurrence No. 9

Map Index: 43411

EO Index: 43411

----- Dates Last Seen -----

Occ Rank: Unknown

Element: XXXX-XX-XX

Origin: Natural/Native occurrence

Site: XXXX-XX-XX

Presence: Presumed Extant

Trend: Unknown

Record Last Updated: 2000-08-15

Quad Summary: Lake Combie (3912111/542D)

County Summary: Nevada, Placer

Lat/Long: 39.01523° / -121.09552°

Township: 14N

UTM: Zone-10 N4320192 E664883

Range: 08E

Mapping Precision: NON-SPECIFIC

Section: 33 Qtr: XX

Symbol Type: POINT

Meridian: M

Radius: 1 mile

Elevation: 1,400 ft

Location: BEAR RIVER. WEST OF MCCARTHY FLAT, BOTH SIDES OF HIGHWAY 49, NEVADA COUNTY.

Location Detail: LOCATION VAGUE: GIVEN AS "BEAR RIVER, NEVADA COUNTY, 1400 FEET". MAPPED AS BEST GUESS BY CNDDDB ALONG THE BEAR RIVER WEST OF MCCARTHY FLAT ON BOTH SIDES OF HIGHWAY 49.

Ecological: UPPER SONORAN ZONE.

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1916 COLLECTION BY HALL; NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Clarkia biloba ssp. brandegeae

Brandegee's clarkia

Element Code: PDONA05053

\_\_\_\_\_ **Status** \_\_\_\_\_ **NDDB Element Ranks** \_\_\_\_\_ **Other Lists** \_\_\_\_\_

**Federal:** None

**Global:** G4G5T2

**CNPS List:** 1B.2

**State:** None

**State:** S2.2

\_\_\_\_\_ **Habitat Associations** \_\_\_\_\_

**General:** CHAPARRAL, CISMONTANE WOODLAND.

**Micro:** OFTEN IN ROADCUTS. 295-885M.

**Occurrence No.** 48

**Map Index:** 65011

**EO Index:** 65090

\_\_\_\_\_ **Dates Last Seen** \_\_\_\_\_

**Occ Rank:** Unknown

**Element:** 2005-06-16

**Origin:** Natural/Native occurrence

**Site:** 2005-06-16

**Presence:** Presumed Extant

**Trend:** Unknown

**Record Last Updated:** 2007-08-28

**Quad Summary:** Lake Combie (3912111/542D), Grass Valley (3912121/542A)

**County Summary:** Nevada

**Lat/Long:** 39.12255° / -121.02809°

**Township:** 15N

**UTM:** Zone-10 N4332228 E670462

**Range:** 09E

**Mapping Precision:** SPECIFIC

**Section:** 30 **Qtr:** SW

**Symbol Type:** POLYGON

**Meridian:** M

**Area:** 13.2 acres

**Elevation:** 1,656 ft

**Location:** CLOVER VALLEY ROAD, ALTA SIERRA SUBDIVISION.

**Location Detail:** MAPPED AT TWO LOCATIONS ALONG CLOVER VALLEY ROAD IN THE SW 1/4 OF SECTION 30 AND THE NE 1/4 OF SECTION 25.

**Ecological:** TYPICAL HABITAT OF OPEN, EXPOSED SLOPES AND ROAD BANKS/CUTS.

**Threat:** DEVELOPMENT.

**General:** OVER 1,000 PLANTS SEEN IN 2005.

**Owner/Manager:** UNKNOWN

Clarkia biloba ssp. brandegeae

Brandegee's clarkia

Element Code: PDONA05053

\_\_\_\_\_ **Status** \_\_\_\_\_ **NDDB Element Ranks** \_\_\_\_\_ **Other Lists** \_\_\_\_\_

**Federal:** None

**Global:** G4G5T2

**CNPS List:** 1B.2

**State:** None

**State:** S2.2

\_\_\_\_\_ **Habitat Associations** \_\_\_\_\_

**General:** CHAPARRAL, CISMONTANE WOODLAND.

**Micro:** OFTEN IN ROADCUTS. 295-885M.

**Occurrence No.** 49

**Map Index:** 65012

**EO Index:** 65091

\_\_\_\_\_ **Dates Last Seen** \_\_\_\_\_

**Occ Rank:** Good

**Element:** 2005-06-16

**Origin:** Natural/Native occurrence

**Site:** 2005-06-16

**Presence:** Presumed Extant

**Trend:** Unknown

**Record Last Updated:** 2007-08-27

**Quad Summary:** Lake Combie (3912111/542D)

**County Summary:** Nevada

**Lat/Long:** 39.11553° / -121.04005°

**Township:** 15N

**UTM:** Zone-10 N4331426 E669445

**Range:** 08E

**Mapping Precision:** SPECIFIC

**Section:** 36 **Qtr:** NW

**Symbol Type:** POINT

**Meridian:** M

**Radius:** 80 meters

**Elevation:** 1,594 ft

**Location:** ALONG WEST SIDE OF BREWER ROAD, ALTA SIERRA SUBDIVISION.

**Location Detail:** MAPPED JUST WEST OF ROAD, ABOUT 0.21 MILE SOUTH OF ALTA SIERRA SCHOOL ON TOPO MAP.

**Ecological:** TYPICAL HABITAT, GROWING ALONG ROAD BANK IN RED CLAY SOILS.

**Threat:** HERBICIDES. RESIDENTIAL AREAS NEARBY.

**General:** APPROXIMATELY 150 PLANTS SEEN IN 2005.

**Owner/Manager:** UNKNOWN

Clarkia biloba ssp. brandegeae

Brandegee's clarkia

Element Code: PDONA05053

\_\_\_\_\_ **Status** \_\_\_\_\_ **NDDB Element Ranks** \_\_\_\_\_ **Other Lists** \_\_\_\_\_

**Federal:** None

**Global:** G4G5T2

**CNPS List:** 1B.2

**State:** None

**State:** S2.2

\_\_\_\_\_ **Habitat Associations** \_\_\_\_\_

**General:** CHAPARRAL, CISMONTANE WOODLAND.

**Micro:** OFTEN IN ROADCUTS. 295-885M.

**Occurrence No.** 64

**Map Index:** 69810

**EO Index:** 70632

\_\_\_\_\_ **Dates Last Seen** \_\_\_\_\_

**Occ Rank:** Good

**Element:** 2006-06-13

**Origin:** Natural/Native occurrence

**Site:** 2006-06-13

**Presence:** Presumed Extant

**Trend:** Unknown

**Record Last Updated:** 2007-09-07

**Quad Summary:** Lake Combie (3912111/542D)

**County Summary:** Nevada

**Lat/Long:** 39.10477° / -121.04003°

**Township:** 15N

**UTM:** Zone-10 N4330232 E669473

**Range:** 08E

**Mapping Precision:** SPECIFIC

**Section:** 36 **Qtr:** SW

**Symbol Type:** POLYGON

**Meridian:** M

**Area:** 1.0 acres

**Elevation:** 1,700 ft

**Location:** ALONG WOLF CREEK RD, 0.3 ROAD MILES EAST OF BREWER RD, 0.9 AIR MILES SOUTH OF ALTA SIERRA SCHOOL.

**Location Detail:** IN THE SE 1/4 OF THE SW 1/4 OF SECTION 36.

**Ecological:** NEXT TO ROAD AND ON SLOPE ABOVE ROAD. NON-NATIVE GRASSLAND W/NATIVE AND NON-NATIVE HERBS. THIS AREA IS SPRAYED WITH HERBICIDES FOR FIRE SAFETY BY NEVADA COUNTY AND PLANT COULD BE EXTIRPATED FROM THIS SITE.

**Threat:** COUNTY SPRAY PROGRAM, MOWING, WEED WACKING AND CLEARING.

**General:** APPROXIMATELY 75-100 PLANTS OBSERVED IN 2006.

**Owner/Manager:** PVT