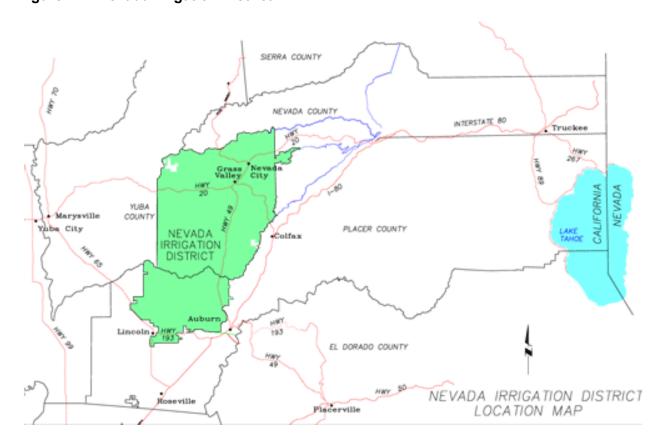


# ANNEX H: NEVADA IRRIGATION DISTRICT

## **H.1 District Profile**

Figure H.1 shows the area covered by the Nevada Irrigation District (NID).

Figure H.1. Nevada Irrigation District



Formed in 1921, the Nevada Irrigation District (NID) is a diversified water resource agency that supplies nearly 25,000 homes, farms, and businesses in Nevada and Placer Counties in the foothills of Northern California's Sierra Nevada Mountains. The District has been serving customers in Nevada, Placer, and Yuba Counties, with about 25 percent of the district located in Placer County. NID provides service in an expansive geographic area covering 287,000 acres that makes the District one of the largest in the State of California.

The District is organized primarily to supply water for irrigation, municipal, domestic, and industrial purposes. NID water is available in wide areas of Nevada and Placer Counties. The district also has storage and distribution facilities in Sierra and Yuba counties.

NID collects water from the mountain snowpack on 70,000 acres of high mountain watershed and stores it in an extensive system of 10 reservoirs. As water flows to customers in the foothills through over 400 miles of canals and another 300 miles of pipeline, it is used to generate clean hydroelectric energy and to provide public recreational opportunities.

The highest elevation on NID mountain watershed is the peak of 8,373-foot English Mountain which rises east of Bowman Reservoir. The District's highest reservoir is French Lake at 6,835 feet. The District's lowest elevation water service is located about 100 miles to the southwest, at 150 feet above sea level, south of Lincoln in Placer County.

NID has been keeping weather records for Bowman Reservoir (elev. 5,650 ft.) since 1929. The 69.2-inch annual average precipitation at Bowman compares to an annual average of 56 inches at 2,700 feet near Nevada City and 52 inches at 2,400 feet in Grass Valley.

NID supplies both treated drinking water and irrigation water and treated drinking water.

## **Irrigation Water**

NID has supplied an average 145,000 acre-feet of water per year. About 90 percent of this total is used for local agriculture and for surplus water sale outside the district.

NID serves approximately 5,400 raw water customers. Most purchase their water on a seasonal basis — the six-month irrigation season normally runs from on or about April 15 through October 14. Some irrigation customers purchase both summer and winter water for year-around service.

Irrigation water is used to irrigate pasture for cattle, sheep, horses and even more exotic animals such as llamas, emus, and buffalo. NID water irrigates nine golf courses. Irrigation water is used in gardens, nurseries, orchards, and vineyards for both commercial and home production. Grapes, apples, peaches, nuts, berries, corn, rice, wheat, and oats are among the many crops grown with NID water.

Irrigation water fills ponds and reservoirs for stock watering, fire suppression, and recreation. Availability of irrigation water is an important factor in the preservation of open space, and greenbelt areas.

There are an estimated 97,000 irrigable acres in the Nevada Irrigation District, about a third of which are presently in irrigation.

# **Treated Drinking Water**

Through the years, NID has changed with the communities it serves. The District continues to supply irrigation water, as it has since the 1920s, but today's demand is for piped and treated drinking water.

Our location near the mountain snowpack, the source of our water, helps to preserve a fresh, clean tasting water that many of our customers believe is among the very best in California.

NID's treated water service areas are located in and around Grass Valley and Nevada City, Banner Mountain, the Glenbrook Basin, Loma Rica, Alta Sierra, Lake of the Pines, Penn Valley, Lake Wildwood, Smartville, and North Auburn.

Generally, treated water is available in the more populated areas. It can be very expensive to extend treated water main lines into rural areas where there are few customers to share the costs. In recent years, the district has been successful in working with local property owners to form local water quality improvement districts.

The transition to treated drinking water began in the late 1960s and early 1970s when NID constructed its first water treatment plants. Today, the district operates a network of six modern water treatment plants in Nevada and Placer counties and a small seventh plant that serves the Smartville community in the Yuba County foothills.

NID presently produces about 3 billion gallons — approximately 9,000 acre-feet — of treated drinking water per year. The district's treatment plants are operated by state-licensed and certified technicians. Water treatment processes include chlorination, coagulation, flocculation, sedimentation, and filtration.

The district operates a state-certified water laboratory where water samples from throughout the district are tested regularly.

NID treated water meets and exceeds standards set by the California Department of Health Services. As required by state law, NID produces an annual water quality report, the Consumer Confidence Report, which is distributed each spring to each treated water customer.

NID's flushing program is conducted annually in the winter months and is designed to keep treated water pipelines clean and ensure a fresh, high quality water supply.

# H.1.1 Hazard Identification and Summary

The NID's planning team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the District (see Table H.1).

Table H.1. NID—Hazard Summaries

Hazard	Probability of Occurrence	Spatial Extent	Potential Magnitude	Significance
Agricultural Hazards				
Avalanche				
Dam Failure	Unlikely	Significant	Critical	Medium
Drought	Likely	Extensive	Catastrophic	High
Earthquake	Unlikely	Extensive	Critical	High
Flood (100-year)				
Flood (Stormwater)	Likely	Limited	Limited	Medium
Human Health Hazards:				
West Nile Virus				
Landslide				
Severe Weather:				
Extreme Cold/Freeze				
Extreme Heat				
Fog				
Heavy Rain/ Thunderstorm/Hail/ Lightning/Wind	Likely	Extensive	Critical	Medium
Snow				
Tornado				
Soil Hazards:				
Erosion				
Expansive Soils				
Volcano				
Wildfire	Occasional	Limited	Limited	Medium

# Guidelines for Hazard Rankings Frequency of Occurrence:

Highly Likely—Near 100 percent probability in next year

Likely—Between 10 and 100 percent probability in next year or at least one chance in ten years

Occasional—Between 1 and 10 percent probability in next year or at least one chance in next 100 years

Unlikely—Less than 1 percent probability in next 100 years

#### Spatial Extent:

Limited—Less than 10 percent of planning area Significant—10-50 percent of planning area Extensive—50-100 percent of planning area

Source: Nevada Irrigation District

#### Potential Magnitude:

Catastrophic—More than 50 percent of area affected
Critical—25 to 50 percent
Limited—10 to 25 percent
Negligible—Less than 10 percent

## Significance (subjective):

Low, Medium, High

Impacts of past events and vulnerability to specific hazards are discussed below (see Section 4.1 Hazard Identification for more detailed information about these hazards and their impacts on Placer County).

# **H.2 Vulnerability Assessment**

The intent of this section is to assess the District's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the main plan.

## H.2.1 Assets at Risk

This section considers the District's assets at risk. Table H.2 lists District assets identified by representatives from the NID as important to protect in the event of a disaster.

Table H.2. NID—Critical Facilities and Other District Assets

Name of Asset	Туре	Replacement Value	Displacement Cost	Hazard Specific Info
Rollins Power House	Critical Facilities	\$13,475,728		Earthquake, Flood, Fire
Combie South Power House	Critical Facilities	\$4,095,002		Earthquake, Flood, Fire
Rollins Reservoir	Critical Facilities	\$67,520,547		Earthquake, Flood
Combie Reservoir	Critical Facilities	\$5,627,736		Earthquake, Flood
North Auburn Water Treatment Plant	Critical Facilities	\$11,357,311		Earthquake, Flood, Fire
Water Canal System	Critical Facilities	\$58,364,373		Earthquake, Flood
Orr Creek Reservoir	Critical Facilities	\$10,539		Earthquake, Flood
Pickett Reservoir	Critical Facilities	\$3,274		Earthquake, Flood

Source: Nevada Irrigation District

Several state or federally listed species may be found within the District boundary. These are identified, along with other species of concern found in the District, in Table H.3 and H.4.

Table H.3. Plant Species of Concern in the Nevada Irrigation District

Name	Status	Habitat	Potential Occurrence
Dwarf downingia Downingia pusilla	CNPS 2.2	Vernal Pools in valley foothill grasslands	Unlikely to occur. No appropriate habitat in the project area. Nearest known occurrence 2.2 air miles northwest of downtown Lincoln, 1.2 road miles south of Wise Road/Hwy. 65 intersection.
Legenere Legenere limosa	CNPS 1B.1	Vernal pools and swales, seasonal marshes, artificial ponds, floodplains of intermittent streams, and other seasonally inundated habitats.	May occur in floodplains of intermittent streams in the project area. Known from only two occurrences in the project vicinity. One located north of Pleasant Grove Creek, south of Placer Boulevard, east of Highway 65. The second is at the Orchard Creek Conservation Bank approximately 3 miles southwest of Lincoln (Jones & Stokes 2002).
big-scale balsamroot Balsamorhiza macrolepis var. macrolepis	CNPS 1B.2	Chaparral, cismontane woodland and valley and foothill grassland, and vernally moist meadows on sandstone, serpentine, or basalt outcrops. From 300 to 4,600 feet in elevation.	Added to table August 2009, no analysis for the project area completed.
Stebbins's morning- glory Calystegia stebbinsii	FE, CE, CNPS 1B.1	Chaparral (openings), cismontane woodland, serpentinite or gabbroic. 600–2,400 ft.	Unlikely to occur. No appropriate habitat present in the project area. This plant is known from fewer than 15 occurrences in specific, isolated areas of Nevada and El Dorado counties (CDFG 2004).
Dubious pea Lathyrus sulphureus var. argillaceus	CNPS 3	Cismontane woodland, chaparral, lower and upper montane coniferous forest. Usually full sun to part shade, woodland openings. 500–1,000 ft.	May occur in woodland habitats on the project site.
Ahart's Dwarf Rush Juncus leiospermus var. ahartii	CNPS 1B.2	Vernal pool margins and mesic valley and foothill grassland areas at elevations of 30–100 meters.	May occur in non-native grassland habitats in the project area. Reported in Placer County only from one occurrence at the Lincoln Airport.
Red Bluff Dwarf Rush Juncus leiospermus var. leiospermus	CNPS 1B.1	Meadows and seeps, vernal pools, and vernally mesic areas in chaparral, cismontane woodland, and valley and foothill grassland from 115 to 3,350 feet.	May occur in woodland and non-native grasslands habitats. Known from north of Roseville in 1982, but was relocated in 1997 (CNDDB 2002).
Butte County fritillary Fritillaria eastwoodiae	CNPS 3	Chaparral, cismontane woodland, lower montane coniferous forest (openings), wet and dry slopes red clay or sandy loam. 100–5,000 ft.	May occur in woodland habitats on the project site.
Brandegee's clarkia Clarkia biloba ssp. brandegeae	CNPS 1B.2	Chaparral, cismontane woodland, often roadcuts. 900– 3,000 ft.	May occur in woodland habitats on the project site. The nearest occurrences are in the Lake Combie Quad along the Bear River (CDFG 2004).
Boggs Lake Hedge-	CE,	Foothill Riparian	May occur in riparian habitat present in

Name	Status	Habitat	Potential Occurrence
hyssop Gratiola heterosepala	CNPS 1B.1		the project area. Known from only three occurrences in the project vicinity. Two of these occurrences are located between Rocklin and Roseville; the third is located just north of Lincoln (Placer County 2003).
Pincushion navarretia Navarretia myersii ssp. myersii	CNPS 1B.1	Vernal pools, valley and foothill (non-native) grasslands in clay soils. 66–1,083 feet.	Northern limits of City of Lincoln. Exact location unknown (needs more fieldwork).

#### Status Codes:

Federal
FE = Federally listed as
Endangered
FT = Federally listed as
Threatened
FC = Federal Candidate species

State
CE = California listed as
Endangered
CT = California listed as
Threatened

CR = California listed as Rare CSC = California Species of Concern CFP = California Fully Protected California Native Plant Society

1B = rare, threatened or endangered in California and elsewhere.

- 2 = rare in California but more common elsewhere.
- 3 = need more information
- 4 = plants of limited distribution; a watch list.
- \_.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- \_.2 = Fairly endangered in California (20-80% occurrences threatened)
- \_.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)

Status and habitat information from California Natural Diversity Database (CDFG 2004), California Native Plant Society Electronic Inventory(CNPS 2003), and USFWS Official Species Lists.

## Table H.4 Wildlife Species of Concern in the Nevada Irrigation District

Name	Status	Habitat	Potential Occurrence
Invertebrates			
Vernal pool fairy shrimp Branchinecta lynchi	FT	Found in vernal pools (seasonal wetlands).	Unlikely to occur. No appropriate habitat present.
Vernal pool tadpole shrimp Lepidurus packardi	FE -	Vernal pools containing clear to highly turbid water.	Unlikely to occur. No appropriate habitat present.
Valley elderberry longhorn beetle Desmocerus californicus dimorphus	FT -	Associated with various species of elderberry shrubs ( <i>Sambucus</i> spp.); generally occurs along waterways and in floodplains.	May occur if elderberry shrubs are present in the project area. Nearest known occurrences in the vicinity of the Lincoln airport and Lincoln Rodeo Grounds.
Fish			
Delta smelt Hypomesus transpacificus	FT CT	Found only in the Sacramento- San Joaquin Estuary and they reside primarily in the interface between salt and freshwater. Decline in population due in large part to reductions in delta	Unlikely to occur. Project is located outside of species' known distribution.

<sup>&</sup>lt;sup>1</sup> Based on table presented in the Lincoln Area Water Treatment Plant Planning and Site Study (NID 2005). Updated by Robertson-Bryan, Inc. for internal use only by NID (August 2009)

Name	Status	Habitat	Potential Occurrence
		water outflow.	
Longfin smelt Spirinchus thaleichthys	CT, CSC	In the Sacramento-San Joaquin estuary adults and juveniles can be found in water ranging from nearly pure sea water to completely fresh water. Adult and juvenile longfin smelt occupy mostly the middle or bottom of the water column in the salt or brackish water portions of the estuary, although larval smelt are concentrated in near-surface brackish waters. Spawning takes place in fresh water, over sandy-gravel substrates, rocks, and aquatic plants.	Unlikely to occur. Project is located outside of species' known distribution.
Central Valley steelhead Oncorhynchus mykiss irideus	FT -	Found in tributaries to the San Francisco Bay, including the south Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in small streams and tributaries with cold, clean water flowing over graveled bottoms and deep pools.	Rainbow trout/steelhead adults and fry have been seen in Coon Creek, Auburn Ravine, Dry Creek, Secret Ravine, and Miners Ravine (CALFED Bay-Delta Program 2000).
Central Valley spring-run chinook salmon Oncorhynchus tshawytscha	FT CT	Found in tributaries to the San Francisco Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	Unlikely to occur. Project is located outside of species' known distribution.
Sacramento winter- run chinook salmon Oncorhynchus tshawytscha	FE CE	Found in tributaries to the San Francisco Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	Unlikely to occur. Project is located outside of species' known distribution.
Central Valley fall/late fall-run chinook salmon Oncorhychus tshawytscha	_ CSC	Found in tributaries to the San Francisco Bay, including the south Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water	The Bear River supports an occasional run of adult fall-run chinook salmon in years when flows are sufficient to provide passage (Yoshiyama et al. 1996).

Name	Status	Habitat	Potential Occurrence		
		in swift, shallow riffles, or at edges of fast runs with loose gravel.			
Green sturgeon Acipenser medirostris	FT CSC	In the Sacramento River, adult sturgeon are in the river, presumably spawning, when temperatures range between 8-14°C. Preferred spawning substrate likely is large cobble, but can range from clean sand to bedrock.	Unlikely to occur. Project is located outside of species' known distribution.		
Amphibians					
California tiger salamander Ambystoma californiense	FT CSC	Breeds in freshwater ponds or vernal pools, in association with upland areas with small mammal burrows	Unlikely to occur. Project is located outside of species' known distribution.		
Western spadefoot toad Spea hammondii	- CSC	Requires vernal pools and seasonal wetlands below 4,500 feet that lack predators for breeding. Also occurs in grassland habitat and occasionally in valley-foothill oak woodlands and orchards.	Unlikely to occur. Project is located outside of species' known distribution.		
California red- legged frog Rana aurora draytonii	FT CSC	Breeds in quiet streams and permanent, deep, cool ponds with overhanging and emergent vegetation below 5,200 feet elevation. Known to occur adjacent to breeding habitats in riparian areas, heavily vegetated streamside shorelines, and non-native grasslands. Sierran streams historically supported populations of red-legged frog; however, these populations have been eliminated.	Unlikely to occur. Project supports minimal suitable habitat and species in not known from the project vicinity. Project area is not designated by USFWS as critical habitat or a core recovery unit. However, the project area is in the historical range of the species. Nearest known occurrence is in El Dorado National Forest, near Michigan Bluff (CNDDB 2004).		
Foothill yellow- legged frog Rana boylii	CSC	Inhabits valley and foothill oak woodland, riparian forest, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows. Breeds in rocky streams with cool, clear water from 0 to 4,500 feet.	Appropriate habitat present in intermittent drainages within the proposed project site. Nearest known occurrences are located in Missouri Creek Canyon in Tahoe National Forest and Greenhorn Creek, where two adults were detected in 1999 (CDFG 2004).		
Reptiles					
Western pond turtle Actinemys marmorata	CSC	Occurs up to 6,000 feet in perennial wetlands and slow moving creeks and ponds with overhanging vegetation. Requires suitable basking sites such as logs and rocks above the waterline.	Appropriate habitat present in Orr Creek Reservoir and stock ponds located within the project area. Nearest known occurrences are located 4 mi. WNW of Newcastle and on Wolf Creek in Nevada County (CDFG 2004).		
California horned lizard	- CSC	Occurs in riparian woodlands and annual grasslands, exposed	Appropriate habitat present in the non- native grasslands in the project area.		

Name	Status	Habitat	Potential Occurrence
Phrynosoma coronatum frontale		sandy-gravelly substrate with scattered shrubs, and clearings from 0 to 6,500 feet.	Nearest known occurrences are 2.5 miles west of Highway 49 and 20 Junction in Nevada City and on Alta Vista Road in Grass Valley (CDFG 2004).
Giant garter snake Thamnophis gigas	FT CT	Primarily associated with marshes and sloughs, less with slow-moving creeks, and absent from larger rivers. Nocturnal retreat is holes, especially mammal burrows, crevices, and surface objects. During the day the giant garter snake often basks on emergent vegetation such as cattails and tules.	Unlikely to occur. Project is located outside of species' known distribution.
Birds			
White-tailed (black shouldered) kite Elanus leucurus	_ CFP	Inhabits herbaceous and open stages of most habitats mostly in cismontane California. Forages in undisturbed, open grasslands, meadows, farmlands and emergent wetlands.	Appropriate nesting and foraging habitat present within the project area.
Northern harrier (nesting <i>Circus cyaneus</i>	_ CSC	Frequents meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands. Mostly found in flat, or hummocky, open areas of tall, dense grasses, moist or dry shrubs, and edges for nesting, cover, and feeding.	May forage in non-native grasslands and nest in the project area.
Swainson's hawk Buteo swainsoni	BCC CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands, suitable grain or alfalfa fields, or livestock pastures.	Unlikely to occur. Project is located outside of species' known distribution.
Ferruginous hawk (wintering) Buteo regalis	BCC -	Winter visitor along the coast from Sonoma County to San Diego County, eastward to the Sierra Nevada foothills and southeastern deserts, the Inyo-White Mountains, the plains east of the Cascade Range, and Siskiyou County. Prefers open terrain, plains, and foothills. Does not nest in California.	Winter Visitor. May forage in non-native grasslands in the project area.
Bald eagle Haliaeetus Ieucocephalus	FD (Delisted on 7/9/07) CE, CFP (nesting and wintering)	Local winter migrant to various California lakes. Most of the breeding population is restricted to northern counties. Regular winter migrants to the region.	Foraging habitat present in Combie Reservoir.
American peregrine	Former FE	Breeds in woodlands, forests,	Unlikely to occur. No appropriate habitat

Name	Status	Habitat	Potential Occurrence
falcon Falco peregrinus anatum	(Delisted on 8/20/99), BCC CE, CFP (nesting)	coastal habitats, and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, or mounds.	present in the project area.
California black rail Laterallus jamaicensis	BCC CFP, CT	Forages and nests in tidal emergent wetlands dominated by pickleweed or in brackish marshes supporting bulrushes and pickleweed; Usually found in immediate vicinity of tidal sloughs.	Unlikely to occur due to lack of suitable habitat. Previously unknown populations were recently discovered in the foothills of Nevada County (Tecklin 1990). Known to occur in isolated marshes along Garden Bar Road, McCourney Road, and in and near Spenceville Wildlife Area (CDFG 2004).
Mountain plover Charadrius montanus	BCC CSC	Short grasslands and plowed fields with little vegetation, and open sagebrush areas of the Central Valley from Sutter and Yuba counties southward.	Unlikely to occur. Project is located outside of species' known distribution.
Long-billed curlew Numenius americanus	BCC	Found in wet meadow habitat in northeastern California in Siskiyou, Modoc, and Lassen counties. Winter visitor along the California coast and in the Central and Imperial valleys.	Winter Visitor. May forage in wet meadows in the project area.
Yellow-billed cuckoo Coccyzus americanus	FC, BCC CE	Inhabits extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, and which abut on slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component of the vegetation.	Unlikely to occur. Project is located outside of species' known distribution.
Western burrowing owl Athene cunicularia	BCC CSC	(Burrow sites.) Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	Unlikely to occur. Project is located outside of species' known distribution.
Vaux's swift Chaetura vauxi	CSC (nesting)	Prefers redwood and Douglas fir habitats with nest sites in large, hollow trees and snags, especially tall, burned-out stubs. Forages over moist terrain and habitats, preferring rivers and lakes.	Unlikely to occur. Project is located outside of species' known distribution.
Black swift Cypseloides niger	BCC CSC (nesting)	Breeds locally in Sierra Nevada and Cascades. Nests in moist crevices or caves, or on cliffs near waterfalls in deep canyons. Forages widely over many habitats; seems to avoid arid regions.	Unlikely to occur. Project is located outside of species' known distribution.

Name	Status	Habitat	Potential Occurrence
Lewis' woodpecker Melanerpes lewis	BCC (nesting)	Winter resident in open oak savannas, broken deciduous, and coniferous habitats with brushy understory. Uses logged and burned areas. Winters in the Central Valley, Modoc Plateau, and the Transverse and other ranges in Southern California. Breeds locally along eastern slopes of the Coast Ranges, and in Sierra Nevada, Warner Mts., Klamath Mts., and in the Cascade Range.	Winter Visitor. May forage in the project area.
Little willow flycatcher Empidonax traillii brewsteri	– CE (nesting)	Wet meadow and montane riparian habitats from 2,000 to 8,000 feet. Breeding seldom occurs below 5,000 feet. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows.	Unlikely to occur. Project is located outside of species' known distribution.
Bank swallow Riparia riparia	CT (nesting)	Migrant found primarily in riparian and other lowland habitats in California west of the deserts. Requires vertical banks and cliffs with fine-textured or sandy soils near streams, rivers, ponds, lakes, and the ocean for nesting. Feeds primarily over riparian areas during breeding season and over grassland and cropland during migration.	Unlikely to occur. Project is located outside of species' known distribution.
Yellow warbler (nesting) Dendroica petechia brewsteri	csc	Uncommon nester over most of California, except the Central Valley, Mojave Desert, and high elevations of the Sierra. Winters along the lower Colorado River and in parts of Imperial and Riverside counties. Nests in riparian habitats dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral. May also use oaks, conifers, and urban areas nears streams.	May occur in woodland and riparian habitats in the project area
Yellow-breasted chat (nesting) Icteria virens	- CSC	Uncommon migrant in California. Nests in a few locations such as Sweetwater and Weber Creeks, El Dorado County; Pit River, Shasta County; Russian River, Sonoma County; Little Lake Valley, Mendocino County; and upper Putah Creek, Yolo County. Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds,	May occur in woodland and riparian habitat in the project area. Documented nesting at Little Wolf Creek, Bear River, Dry Creek, Indian Springs Creek, Deer Creek, and the Middle and South Yuba River (Nevada Co. Planning Dept. 2002).

Name	Status	Habitat	Potential Occurrence
		blackberry, and grape.	
Modesto song sparrow Melospiza melodia mailliardi	- CSC	Found in a variety of habitats including: riparian willow thickets, valley oak riparian with an understory of blackberry, ruderal areas along levees and irrigation canals, and cattail and tule marshes.	May occur in riparian habitats in the project area. Known to occur in western Placer County and adjacent Sierra foothill counties (Grinnell and Miller 1944; Gardali 2002).
Grasshopper sparrow Ammodramus savannarum	_ CSC	Occurs in dry, dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches.	May occur irregularly in non-native grasslands in the project area. One singing male was found in an annual grassland east of Lincoln; it was only present for a few days (April 1999). A fall migrant was found along Brewer Road (September 1999). (Easterla pers. comm.; Webb 2003.)
Tricolored blackbird Agelaius tricolor	BCC CSC (nesting colony)	Breeds near freshwater, preferably in emergent wetland with tall dense cattails or tules, but also in thickets of willow, blackberry, wild rose, and tall herbs. Feeds in grassland and cropland habitats. Found throughout the Central Valley and on the coast.	May forage in non-native grasslands and next in some raw water storage facilities.
Lawrence's goldfinch Carduelis lawrencei	BCC	Occurs in valley foothill hardwood and valley foothill hardwood-conifer. Breeds in open oak or other arid woodland and chaparral, near water.	May occur in woodland habitats in the project area.
Loggerhead shrike Lanius Iudovicianus	CSC (nesting)	Open habitats with sparse shrubs and trees (or other suitable perch sites) and bare ground and/or low, sparse herbaceous cover; oak woodlands for nesting. Found in lowlands and foothills throughout California.	May forage in non-native grasslands and nest in woodland habitats in the project area.

Name	Status	Habita	nt	Potential Occurrence
Mammals				
Spotted bat Euderma maculatum	- CSC	and grasslands through mixed		May roost or forage in the project area in all habitat types, but project area outside of species' historic range.
Greater western mastiff bat Eumops perotis californicus	csc	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, chaparral, desert scrub, and urban areas in southeastern San Joaquin Valley and Coastal Ranges from Monterey County south. Typically roosts in caves, crevices or other rock formations. Requires open areas for foraging.		Unlikely to occur. Project area is outside of species' known distribution.
Townsend's big- eared bat Corynorhinus townsendii	_ CSC	Occurs from low desert to midelevation montane habitat. Occurs in rural settings, inland deserts, coastal redwoods, oak woodland of the inner Coast Range and Sierra, and low to mid-elevation mixed forest.		May roost or forage in the project area in all habitat types, but project area outside of species' historic range.
Status Codes				
Federal FE = Federally listed as Endangered FT = Federally listed as Threatened = Federal Species of Concern FC = Federal Candidate species FPT = Federally Proposed Threatened BCC = Birds of Conservation Concern		CT = Californ CR = Californ CSC = Califo	nia listed as Endangered nia listed as Threatened nia listed as Rare rnia Species of Concern rnia Fully Protected	
Status and habitat information is taken from California Natural Diversity Database (CDFG 2004), Zeiner et al. (1990), and USFWS Official Species List				

## **Growth and Development Trends**

Population growth and development trends within NID boundaries are covered in Section 4.3.2 of the main plan and in the individual annexes of the incorporated communities falling within the service area of the District.

<sup>&</sup>lt;sup>1</sup> Based on table presented in the Lincoln Area Water Treatment Plant Planning and Site Study (NID 2005). Updated by Robertson-Bryan, Inc. for internal use only by NID (August 2009).

## **H.2.2 Estimating Potential Losses**

#### **Dam Failure**

A dam failure can range from a small uncontrolled release to a catastrophic failure, caused by prolonged rainfall and flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. Dam failure flooding varies by area depending on which dam fails and the nature and extent of the dam failure and associated flooding.

The district's highest dam is the rock fill-earth core dam at Rollins Reservoir, built in 1965 and standing 242 feet tall. The Jackson Meadows dam (1965) is second highest at 195 feet, Scotts Flat dam (1965) is 175 feet, and the Bowman South Arch dam (1925) is 171 feet high.

French Dam, constructed in 1858-59, is the district's oldest dam still in use. Other dams that originated in the 1800s include the Bowman Rockfill dam (1872), and Faucherie, Sawmill and Jackson, all constructed prior to 1880. In the lower division, Van Giesen Dam at Combie Reservoir is the oldest, built in 1928.

Vulnerability to dam failures is generally confined to the areas subject to inundation downstream of the facility. Based on analysis provided in the Placer County General Plan Background Report, only five dams within Placer County have the potential to affect more than 100 persons: Folsom Dikes No. 5 & 6; Lake Tahoe Dam; Camp Far West Dam; Lake Combie Dam; and Rollins Reservoir Dam. Of these five, a failure of Rollins Reservoir or Combie Dams could potentially impact areas within the NID. Failure of Dutch Flat Forebay could also potentially impact services provided by NID.

### **Drought**

The impact of a drought on the District is primarily one of water supply. Most water provided by the NID comes from snowmelt from their high mountain watershed. A multiple year drought can severely compromise the water supply within the district. In 1991-1992, drought conditions severely impacted the District and other areas of Placer County and surrounding California foothills. This drought, considered the driest period on record in 15 years, resulted in loss of crops and severe economic impacts to the agricultural industry.

Most recently, after 2 years of below-average rainfall and very low snow-melt run off, Governor Schwarzenegger in June of 2008 declared a state of emergency for drought conditions statewide. The final California Department of Water Resources showed snowpack water content at only 67 percent of normal. With the unknowns of drought and globally changing climate conditions, the NID more than ever is promoting waster conservation to its customers.

The most severe drought in recent times to affect the District and all of California is the drought of 1977-1978. This drought was severe enough to trigger implementation of the District's

Drought Contingency Plan at the most restrictive level – that of mandatory rationing and reduction in service to irrigation customers up to 50%. A more recent drought in 1989-1991 only required voluntary conservation measures by District customers, thus implementing Step 2 of the Drought Contingency Plan.

## Severe Weather: Heavy Rain/Thunderstorm/Hail

Heavy rain, thunderstorm activity, and hail usually occur on an annual basis in the NID service area. Often during these events, the raw water distribution system can be impacted; however, the District did not identify any past events resulting in significant damage. Heavy runoff from storm activity can cause excessive water in District canals resulting in an overtopping of the canal. An overtopping will washout the canal berm resulting in flood damage and interruption of the water supply.

#### Other Hazards

While of lower planning significance to the District relative to other hazards, the following information about earthquake, flood, and wildfire should still be noted:

## Earthquake

Damage to critical infrastructure resulting in loss or interruption of drinking water and raw water supplies is a primary concern to the district from a damaging earthquake. Extreme earthquake would cause a dam failure endangering the life and health of downstream inhabitants.

#### Flood

Flooding and soil erosion due to heavy rains and snow runoff have been a historical problem throughout Placer County. Abundant snowfall in the mountains combined with rain and steep terrain can mean rapid runoff and flooding. Water flow can be high in peak runoff periods with historical downstream flooding. The primary impacts from flooding within the district include damage to roads, utilities, bridges; and flooding of homes, businesses and critical facilities. Flooding has also caused canals to overtop and erosion of the canal levees.

The most recent flood event to impact the District is the late December floods of 2005. Excessive rain for a prolonged period caused severe flooding in the Sierra foothills, in and around Placer County. Impacts included damage to the District's canal system as well as damage to roads and properties throughout District boundaries.

NID suffered the loss of a canal berm on the Combie Ophir IV Canal resulting in damage and flooding on private property

#### Wildfire

All communities within the northwestern portion of Placer County served by the NID are listed on the National Fire Plan's "Communities at Risk" list as set forth in Section 4.3.2 of the main plan.

Over one hundred years of aggressive fire suppression under the national fire suppression policy has rendered wildlands severely overgrown. Much of the private land in the District's area is in the wildland urban interface with increasing residential development.

As more people move into the area and impacts from recreational demands increase, there will be more human-caused wildfire starts each year. And, the increased number of widely scattered homes within the District adds greatly to the danger, complexity, and cost of fighting these fires.

Forest overgrowth due to the efficiency of modern firefighting techniques, and to society's current election to limit forest thinning and harvesting, is a serious problem. If wildfire does not impact the forest first, native insects will eventually kill millions of trees. Explosions in insect populations usually start during a drought, when the lack of water combined with too many trees per acre render the trees too weak to fight off the insect attacks. Without a change in management practices on public lands, there is little hope of avoiding a kill off of trees similar to the kill off experienced by other national forests.

The most notable recent wildfire to impact the District was the Washoe Fire in August 2007. This fire occurred in the wildland urban interface area of the Tahoe Park and Tahoe Woods subdivisions, along the west shore of Lake Tahoe. Although no lives were lost, the fire destroyed 5 residential structures and encompassed 19 acres. Power and gas utilities incurred damages. There were also losses to timber assets, loss of watershed protection, and loss of the aesthetic value of a scenic corridor. This event caused major disruptions to the west shore and Tahoe City traffic and business on a busy summer weekend. Highway 89 in West Lake was closed for a period of time.

# H.3 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities; administrative and technical mitigation capabilities; fiscal mitigation capabilities; mitigation outreach and partnerships; and other mitigation efforts.

# **H.3.1 Regulatory Mitigation Capabilities**

Table H.5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the NTFPD.

Table H.5. NID's Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	No	
Zoning ordinance	No	
Subdivision ordinance	No	
Site plan review requirements	Yes	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	
Building code	No	
Erosion or sediment control program	No	
Storm water management program	Yes	
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	Yes	
Other special plans	No	
Flood Insurance Study or other engineering study for streams	No	

Source: NID

As indicated above, the District has several programs, plans, policies, codes, and ordinances that guide hazard mitigation. Some of these are described in more detail below.

## NID Urban Water Management Plan, 2005

NID's Urban Water Management Plan addresses many issues related to the sound and sustainable use of water. These include information relating to water sources, reliability planning, water use provisions, water demand management measures, and water shortage contingency plan.

## **Drought Contingency Plan, 1992**

The Alpine Meadows Drought Contingency Plan supplements urban and agricultural plans and identifies drought caused water shortages and water demand reduction goals within the District during a drought. The plan contains a 5-step contingency process depending on the severity of the drought. These steps range from encouraging voluntary conservation to mandatory reductions in service.

# H.3.2 Administrative/Technical Mitigation Capabilities

NID is governed by a five-member Board of Directors, elected to four-year terms by District voters. The board is the District's policy-making body and policy is carried out by approximately

175 full- and part-time employees. Members of the board are elected from within and represent five geographical divisions within the district.

As a state agency, NID operates under rules and regulations adopted under authority conferred by the California Water Code. NID is headquartered at an 18-acre site located on West Main Street in Grass Valley. The District also operates a maintenance yard on Gold Hill Road near Lincoln and a Hydroelectric Department office off Interstate 80 near Colfax.

Table H.6 identifies the personnel responsible for activities related to mitigation and loss prevention in NID.

Table H.6. NID's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/Engineer with knowledge of land development/land management practices	Yes	Chief Engineer/Assist. General Manager	
Engineer/Professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineering Department/Maintenance Department Deputy Manager	
Planner/Engineer/Scientist with an understanding of natural hazards	No		
Personnel skilled in GIS	Yes	Engineering/Sr. Drafter	
Full time building official	No		
Floodplain Manager	No		
Emergency Manager	Yes	Management/Assist. General Manager	
Grant writer	No		
Other personnel	Yes	Trained Staff	
GIS Data	Yes		
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No		

Source: NID

# **H.3.3 Fiscal Mitigation Capabilities**

Table H.7 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table H.7. NID's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	No	
Capital Improvement Project Funding	Yes	On Board approval
Authority to levy taxes for specific purposes	Yes	CFDs only

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Fees for water, sewer, gas, or electric services	Yes	Water only
Impact fees for new development	Yes	Water capacity charges
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Incur debt through private activities	No	
Withhold spending in hazard prone areas	No	

Source: NID

## H.3.4 Mitigation Outreach and Partnerships

Cosumnes, American, Bear, and Yuba (CABY) Integrated Regional Water Management Plan is identified by the District as examples of successful partnering with other agencies

## **H.3.5. Other Mitigation Efforts**

The District is involved in a variety of mitigation activities including several projects, which include:

- Combie North Powerhouse Replacement Project
- NID Regional Water Supply Project
- Cement Hill Water Supply Project
- DS Canal Flume Replacement Project
- Cole Siphon Replacement Project
- Rock Creek Bypass Encasement Project
- Lincoln Canal Encasement Project
- North Auburn Highway 49 Transmission Project
- Woodrose Way Pipeline Replacement Project
- Lower Cascade Canal Project
- E. George Water Treatment Plant expansion

## **H.4 Mitigation Strategy**

## **H.4.1 Mitigation Goals and Objectives**

The Nevada Irrigation District adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

# **H.4.2 Mitigation Actions**

The planning team for the NID identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and schedule are included.

#### 1. Portable Generator Project

**Issue/Background**: The North Auburn Water Treatment Plant serves approximately 6,700 people with domestic drinking water in the North Auburn area. Extensive power outages in the area can occur as the result of fires, severe storms, acts of terrorism, and other unforeseen disasters. During periods of extended power outages water supplies can run low and additional water cannot be processed for consumptive use without electrical power. Nevada Irrigation District is studying the advantages of portable generators and stationary generators and how best to add address these electrical power issues.

#### Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Nevada Irrigation District's Engineering Department

**Responsible Office**: Nevada Irrigation District.

Priority (High, Medium, Low): High

**Cost Estimate**: Approximately \$400,000.

**Benefits** (Losses Avoided): Continued water service to 6,700 people, including Auburn Faith Hospital, during catastrophic events.

**Potential Funding**: Unknown.

**Schedule**: Next one to two years.

#### 2. Canal Culvert Replacement Program

**Issue/Background**: Canal crossings are facilitated with numerous culverts throughout the Placer County area. These culverts are often undersized, aged, and failing. During heavy storm and rain conditions these culverts backup water causing flooding and overtopping of the canal upstream of the culvert. Overtopping on a canal often results in erosion of the canal berm and possible property damage. Nevada Irrigation District is currently engaged in a culvert replacement project aimed at resolving these issues.

#### Other Alternatives:

**Existing Planning Mechanism(s) through which Action Will Be Implemented**: Nevada Irrigation District's Engineering and Right-of-Way Departments.

**Responsible Office**: Nevada Irrigation District and associated property owners.

Priority (High, Medium, Low): Low

**Cost Estimate**: Costs vary at each culvert replacement; however, the estimated cost to replace the average large culvert is about \$12,000.

Benefits (Losses Avoided): Life Safety; Reduction in property loss.

Potential Funding: Unknown.

**Schedule**: Next 5 to 10 years.

## 3. Reservoir Cleaning

**Issue/Background**: Small reservoirs located within the canal system are filling in with sediment from continued years of use. Adequate reservoir storage is very beneficial during storms and heavy rain. As the reservoir accumulates sediment water storage is reduced and the ability to regulate water efficiently is diminished. Reduced reservoir storage can result in upstream canal overtopping and property damage. Nevada Irrigation District has initiated a small reservoir cleaning program to alleviate this problem.

#### Other Alternatives:

**Existing Planning Mechanism(s) through which Action Will Be Implemented**: Nevada Irrigation District's Engineering and Maintenance Departments.

**Responsible Office**: Nevada Irrigation District.

Priority (High, Medium, Low): Medium

**Cost Estimate**: Approximately \$15,000 per reservoir.

Benefits (Losses Avoided): Associated property damage.

Potential Funding: Unknown.

**Schedule**: Next three to five years.