

Abbreviated Vernal Pool and Delta Ecosystem Culturally Significant Species Accounts

This list of culturally significant species is intended to provide an ecocultural context to guide environmental impact analysis. The focus of this list is federally listed or formerly listed species, which represent a tangible trust responsibility to be upheld pursuant to self-determination rule (PL 93-638). By no means is this list comprehensive, as the interconnected nature of species within the foodweb is much more complex, and the understanding of these relations is fragmented at best given the context of environmental change in the surrounding land/sea scape. Beyond this, there is the cultural relationship with these species, which is more complex than can be expressed herein. Further there is restricted knowledge that cannot be shared in this context. Ecoculturally, there is a relationship through kinship that binds Miwko? to uphold traditional obligations to these species as our relations; to be the voice for them to ensure their needs are met for unborn generations.

California tiger salamander *Ambystoma californiense*

?Appanta? (tiger salamanders) and sunuunu? (larval salamanders) are an important part of the traditional Miwko? diet. The larvae were harvested from vernal pools throughout the Sacramento vernal pool region. One important gathering area was in the vicinity of the historic village of Sunulumne? (place of the tiger salamander larvae) near Herald, where larger vernal pool complexes were known to occur.

The Central Valley population of the California tiger salamander was listed as threatened in 2004 (69 FR 47212). They require pools with relatively long hydrology to facilitate their development from egg to metamorphosis. They are typically associated with vernal pools and perennial wetlands, grassland ecosystems, valley oak, blue oak woodland, and adjacent chaparral ecosystems which provide habitat for breeding, feeding, and sheltering. They may utilize down woody debris for cover. They also rely on burrows created by other animals including ground squirrels (*Spermophilous beecheyi*), pocket gopher (*Thomomys bottae*), and burrowing owls and crevices for sheltering and estivation habitat. They are largely omnivorous. Larvae are known to eat aquatic invertebrates and zooplankton, and larger prey (e.g., larvae of other amphibians) as they develop (see Anderson 1968).

Vernal Pool Crustaceans

Several vernal pool crustaceans became federally listed as endangered or threatened in 1994 (59 FR 48136). Many of these species are difficult to distinguish without magnification. Some species of vernal pool crustaceans are known from sacred sites within the storyscape. In the Diablo foothills, for instance, some of the places they are known from are not typical habitats, and their existence from a cultural perspective is of great significance. While they may not appear each year, traditionally, their appearance during the wet season is associated with spirit beings in this environment. Their presence is a good omen. Vernal pool crustaceans are an ephemeral component of seasonally flooded environments. They are an important source of food to many organisms.

-Vernal Pool Fairy Shrimp *Branchinecta lynchi*

The vernal pool fairy shrimp (fairy shrimp) is federally listed as threatened. This crustacean is found in vernal pools, swales, and other seasonal pools in California and southern Oregon. The autecology of fairy shrimp has been noted by Eng et al. (1990) and Simovich et al. (1992) amongst others. Fairy shrimp may be observed in impoundments following inundation by rainwater, and quickly develop to maturity. They can persist for long periods of time as cysts in dry soils. Ecologically, they are filter feeders, and play a role in cleaning water. They are an integral component of functional wetland ecosystems and food webs.

-Vernal Pool Tadpole Shrimp *Lepidurus packardii*

The vernal pool tadpole shrimp (tadpole shrimp) is federally listed as threatened. This crustacean is found in vernal pools, swales, and other seasonal wetlands with extended hydroperiods in California. The autecology of fairy shrimp has been noted by Eng et al. (1990) and Simovich et al. (1992) amongst others. After hatching, they may develop to maturity within one to two months.

-Conservancy fairy shrimp *Branchinecta conservatio*

The conservancy fairy shrimp is federally listed as endangered. It is known from vernal pool habitats in isolated locations within the Central Valley and southern California. They typically reach maturity within a month and a half, and are relatively long lived considering the nature of their habitat.

Delta Smelt *Hypomesus transpacificus*

Cokuupu? (Delta smelt) are an integral component of the endemic aquatic foodweb of the Delta. Their existence and pertinence in this region is noted by the historic village of Cokuupumne? (the place of the minnow) in the vicinity of modern day Liberty Island. They are an indicator species for aquatic environmental quality.

The Delta smelt was listed as a threatened species in 1993 (58 FR 12854). It is a short-lived species, with a lifespan of about one year. It is an endemic species to Suisun Bay and the Delta. It is tolerant of a range of salinities, but is found frequently at the edge of the freshwater mixing zone. Historically, the mixing zone was variable across the delta, but is heavily managed in modern times. Larvae and juveniles forage on zooplankton, and places with high densities of phytoplankton and zooplankton are essential for their food requirements. It spawns primarily between December to July in tidal backwaters and channels with submerged aquatic plants (see Moyle 1976).

Sacramento Splittail *Pogonichthys macrolepidotus*

Nattah (Sacramento splittail) are an important part of the traditional Miwko? diet. They were available within the greater Delta region throughout the year, and are well represented in the zooarchaeology of historic village sites of the region.

The Sacramento splittail had been listed as a threatened species in 1999 (64 FR 5963), but due to political pressure was delisted in 2003. They are a large endemic minnow, which historically occurred from the Sacramento River to Redding and the San Joaquin River to Friant. Splittail typically spawn between January to July in tidal emergent wetlands where the larvae develop

protected from predators. Currently, a lack of suitable cover and poor water management are among key limiting factors threatening the Sacramento splittail.

Contra Costa goldfields *Lasthenia conjugens*

Goldfields are traditionally used for flower wreaths worn by female dancers during the spring ceremonies. The flowers are collected and threaded onto string to make headbands and necklace chains (similar to leis).

Contra Costa goldfields represent one of several species of goldfields known from vernal pools and swales throughout the region. Contra Costa goldfields flowers in the spring, typically between March and June. It is insect pollinated, and is visited by a variety of invertebrates from butterflies to bees, with some solitary bees being specialists.

Fleshy owl's-clover *Castilleja campestris* ssp. *succulenta*

Some species of *Castilleja* are favored nectar plants. Conversion of many regional habitats makes the ethnobotanical use of this particular species uncertain, but given the plant is a nectar source for other organisms, it is probable it may have been used as such in a cultural context.

Fleshy owl's clover was listed as threatened in 1997 (62 FR 14338). It is an annual herb that is hemiparasitic, and lives in the transitional zones of seasonal wetlands. It is distinguished by its brittle leaves and yellow to white flowers which typically bloom in late spring.

California condor *Gymnogyps californianus*

As Miwko? are descended from birds, Molluk is central to creation. While many other Native American groups throughout the range of Molluk have connections with condors, in the context of Miwko? culture the place for Molluk is situated on Wolwonja? (Mt. Diablo) and associated places southwards along the Diablo Range to Ujumpile?. As a central figure to creation, Molluk is connected to all of creation. Molluk features in traditional healing ceremonies through Mollukenu? (the one who dances the condor). Historical accounts and collection of Mollukenu?-associated items have this ceremony occurring along the Cosumnes River near the village of Olanapatme?, but also at other sites as evidenced by ritual burials of Molluk elsewhere in the traditional territory. Healthy populations are an indicator of environmental quality. If the lands and waters are in good condition, Molluk will be plentiful as there will be sufficient food for them, and there will be plentiful nesting and roosting sites.

The California condor was listed on the Endangered Species List in 1967. While in recent history California condors were known along the Pacific coast from Southeast Alaska to Baja California and eastward to the Great Basin and Columbia Plateau, by the 1950's they were restricted to the Southern Sierra Nevada, Transverse Range, and south Coast Range. In 1987 there were 27 surviving condors, which were all captive, and contributed to the captive breeding program. Condors are carrion eaters, and opportunistically forage on carcasses of many animals ranging from marine mammals to ground squirrels. Condors form life-long pair bonds, and are long-lived (upwards of 75 years). A healthy pair will produce about one chick every two years, and there is a lot of parental investment in their progeny.

Burrowing owl *Athene cunicularia*

Tokkokko? is a totem of the water moiety due to its association with the short grass of vernal pool ecosystems. Tokkokko? are connected with many species including ?Appanta? and other burrowing animals in the grasslands and vernal pools of the region.

Burrowing owls are not federally listed, but is a species of concern. They nest and roost in burrows created by a range of species including ground squirrels, fox, and other mammals. Their diet consists of a diversity of prey items including insects, small mammals, birds, reptiles, amphibians, and carrion. They are most closely associated with short grass species, which enable them to be vigilant of their surroundings.

Bald eagle *Haliaeetus leucocephalus*

Hopa? are associated with Miwko? creation. They feature within the traditional stories, and have a storyplace located along the Sacramento River between Isleton and Kimball Island. Here, it is understood that suitable nesting, roosting, and foraging habitat was historically present. Here specifically, they should be abundant, and would be known from other areas of the greater Delta region based on the abundance at this location. They would be foraging waterfowl and shorebirds from vernal pools and other wetlands, upon carrion in the uplands, and fishing from the rivers and wetlands of the region. They would be nesting in riparian forests and oak woodlands throughout the region as well.

Bald eagles are protected pursuant to the Bald and Golden Eagle Protection Act, and were listed as threatened in 1967 for populations in the lower 48 states of the United States. They have since been delisted, but are not in abundance in the Miwko? traditional territory as they should be.

Peregrine falcon *Falco peregrinus anatum*

Wekwek is a central figure in Miwko? creation. Similar to Molluk, Wekwek is integral to the relations of all of creation. The stories of Wekwek span the entire world from land to sea from Ujumpile? to Talawit. Wekwek fiercely defends many sacred sites. Traditionally, birds are taken ceremonially from the nest, and are kept captive for use of their feathers in regalia, and protection of the roundhouse during ceremony.

The American peregrine falcon was historically listed as endangered in 1970, and was delisted in 1999. While peregrine has been delisted, it is still not prevalent in the context of cultural considerations.

Golden eagle *Aquila chrysaetos*

Wipakah is used ceremonially. Like peregrine falcon, birds are taken ceremonially from the nest, and are kept captive for use of their feathers in regalia, and protection of the roundhouse during ceremony.

Golden eagles are protected pursuant to the Bald and Golden Eagle Protection Act. Golden eagles are regionally associated with grasslands, oak woodlands, and wetlands (including vernal pools). They nest in tall trees or on cliffs. Throughout the Delta region they would have

established breeding territories primarily in valley oak woodlands. They forage for small mammals, birds, and carrion. Historically, the Livermore-Amador Valley supported one of the highest densities of golden eagles in the world. Due to urbanization, water infrastructure development, wind farms, and other impacts, their numbers are greatly diminished. Due to continued habitat loss and modifications, golden eagles continue to decline regionally, and could face local extinction due to a lack of oversight for populations.