C.3 Weed Descriptions

APPENDIX C-3 – WEED DESCRIPTIONS

Noxious weeds present a severe threat to natural habitats. When noxious weeds become established in an area, they can cause a permanent or long-lasting change in the environment by increasing vegetative cover, thereby creating a dense layer that prevents native vegetation from germinating, and essentially halting normal successional processes that would typically allow an area to recover from disturbance. Weed populations can also alter edaphic and hydrological conditions and structure through nitrogen fixation (as in Spanish broom, *Spartium junceum*) or draining of the water table (as in giant reed [*Arundo donax*]). Monocultures of noxious weeds typically create an unfavorable environment for wildlife. Consequently, mutualistic species necessary for native plant life cycles, such as seed dispersers, fossorial mammals, or pollinators, can be lost from the area. Heavy infestations can also significantly reduce the recreational or aesthetic value of open space. This being said, weed control efforts are costly, labor intensive, often require several years of follow-up monitoring and a combination of control methods to completely eradicate populations, and in many cases pose significant risk to native plants that may occur within the weed control area. Even still, the ecological costs and risks associated with not managing noxious weed populations are so great that these exceed risks posed by most control methods (DiTomaso, 1997).

Weed species occurring in the Study Area and along the haul routes are ranked by three threat levels as defined by Cal-IPC (Cal-IPC, 2012):

- **High** – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- **Moderate** – These species have substantial and apparent (but generally not severe) ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
- **Limited** – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.
- **Evaluated Not Listed** – Sufficient information is lacking to assign a rating or the available information indicates that the species does not have significant impacts at the present time

Species Accounts

High Risk Invasive Plant Species

Tamarisk (Tamarix sp.)

Cal-IPC Pest Rating: High.

Present at the project site: Yes.

This species occurs in a large stand on the east side of the southern extent of the Reservoir. Current levels of this species are low however the salt cedar can quickly colonize open stream terraces after scouring events provided a source population is present.

Description:

Tamarisk is a type of woody shrub or small tree in the tamarisk family (Tamaricaceae) that invades desert washes and arid riparian areas throughout the western U.S. The Tehachapi Mountains are known to support at least four related Eurasian species with the common names Chinese tamarisk (*T. chinensi*), French tamarisk (*T.gallica*), smallflower tamarisk (*T. parviflora*), and saltcedar (*T. ramosissima*). Tamarisk reproduces by seed and by root sprouting or even disconnected stem fragments. Seedlings have very low survivorship because the deep root system that would protect them from desiccation or being washed away in floods is undeveloped (DiTomaso and Healy, 2007). Once this root system forms, however, tamarisk trees are associated with several negative effects, including draining of the water table, loss of diversity, and reduced habitat quality for many bird and wildlife species. Seed germination is not inhibited in saline soils, and the plants can tolerate saline conditions quite well. The plants can extract groundwater efficiently from deep in the soil profile and sequester the resulting salts in their leaf tissues. When these tissues decompose on the soil surface, they increase soil salinity, making the site less suitable for native species. Once established, tamarisk can spread quickly through vegetative means.

Control:

Prevention: Sites with intact native riparian vegetation are resistant to tamarisk invasion because the seedlings are such poor competitors. Minimizing impacts in riparian and desert wash habitats and restoring any necessary impacts with native vegetation will thus reduce the potential for tamarisk invasion into new areas.

Mechanical: Trees cut from the soil surface re-sprout from the root system, so aboveground tree removal should be followed with herbicidal methods as outlined below. Otherwise, the root system will need to be manually removed, which may cause more soil disturbance than necessary and leave the site open to new invasions.

Biocontrol: In 2002, the saltcedar beetle (*Diorhabda elongata*) was released in efforts to control tamarisk, but it is not yet known how effective the species will be in control of these species (DiTomaso and Healy 2007).

Fire Management: Burning is not recommended because plants re-sprout readily following fire.

Herbicide: Cut stumps should be painted with an herbicide preparation specifically approved for use in aquatic and wetland ecosystems in California. Care should be taken to use a strong enough application to kill the root crown bud. Repeat applications are required the following year when seedlings germinate in the spring. Young plants are easily scraped with a Hula Hoe or pulled by hand.

Moderate Risk Invasive Plant Species

Tocalote (Centaurea melitensis)

Cal-IPC Pest Rating: Moderate.

Present at the project site: Yes.

This species occurs in a single location along Cheseboro Road downstream of the dam structure.

Description:

Tocalote, also known as Maltese star-thistle, is an annual plant in the sunflower family (Asteraceae) that is native to southern Europe. It is widely distributed throughout California, with larger, more problematic populations being found in central-western and southwestern regions of the state within grassland and oak woodland communities. Dense infestations of tocalote threaten natural ecosystems by displacing native plants and animals. This species has an earlier phenology (annual timing of life stages) than the closely related, more widespread yellow star-thistle (*C.solstitialis*), and generally flowers from April to June (Bossard et al., 2000). Tocalote also is similar in appearance to yellow star-thistle. As it flowers and senesces earlier in the year than yellow star-thistle, control treatments should be timed appropriately. Otherwise, mechanical and herbicidal control techniques developed and used for yellow star-thistle are also effective for tocalote infestations (DiTomaso and Healy 2007).

Control:

Prevention: When working in areas infested with tocalote, equipment (including undercarriages) should be carefully cleaned before moving to a non-infested area. The collection and export of fill soils, pasture hay, and crops from infested areas should be avoided or minimized to the maximum extent practicable.

Mechanical: Mowing can provide effective treatment of infested areas if mowed at the correct time, which is immediately after the earliest 2 to 5% of plants have begun to produce flower heads, usually in April or early May (DiTomaso and Healy 2007). Mowing too early may cause plants to become bushier and produce more flower heads. Treatments should continue for at least 2 to 3 years, after which spot eradication may be required indefinitely.

Biocontrol: Responsible rangeland management, where range is grazed by sheep, goats, or cattle to a moderate degree can help prevent establishment or spread of populations in grasslands. Infested areas can be treated by high-intensity grazing between the period when the plant bolts (April) to just before the plant produces spiny seed heads in May-June. Biocontrol insects used to control yellow star-thistle may also feed on tocalote flower heads, but are more attracted to, and better at damaging yellow star-thistle.

Fire Management: Prescribed burning of tocalote can reduce populations if timed correctly, but to avoid heavy damage to native vegetation, burns should be timed to occur after other annual plants have dried but before tocalote seeds are produced. Due to its late spring-early summer flowering period, burning may be difficult to implement for tocalote.

Herbicide: Herbicide treatments by foliar spray or wick application are generally used to control or reduce spot infestations, or as follow-up to more intensive mechanical, grazing, or fire management-based treatments.

Shortpod Mustard (*Hirschfeldia incana*)

Cal-IPC Pest Rating: Moderate.

Present at the project site: Yes.

Summer mustard is distributed at several locations along the main access road adjacent to the Reservoir.

Description:

Shortpod mustard (*Hirschfeldia incana*) is an annual or short-lived perennial forb in the mustard family (Brassicaceae) that is native to Eurasia. It matures quickly in the spring and produces a large amount of biomass in infested areas, potentially outcompeting native species through shading or an early reduction in soil moisture. Reproduction occurs by seeds, which are sticky when wet and are thus easily transferred by equipment, vehicles, or people working or traveling through infested areas when moisture is present (Brooks 2004). Similar to other invasive mustard species, shortpod mustard can build up a large, long-lived seed bank at infestation sites. This species often invades areas dominated by exotic annual grasses and can contribute to type conversion of woodlands and scrublands into annual grasslands by adding to the early season fuel load of an area, as this can increase the amount of fuel available for fires. Fire frequency and intensity can increase such that shrub and tree species can no longer establish or survive. While the species is generally considered a successional plant, and thus might be expected to decrease in density or extent with increasing time since disturbance, the typically large seed bank in combination with repeated disturbance in riparian areas or associated with heavy grazing can favor the establishment of long-term infestations (Brooks 2004).

Black mustard (*Brassica nigra*) is very similar in appearance to shortpod mustard, and the two species are often difficult to tell apart in the field. The ecological effects of black mustard invasion are virtually identical to shortpod mustard in how it impacts ecosystems, but black mustard tends to be taller, may regularly produce denser infestations than shortpod mustard, and may be more widespread. It can readily invade chaparral and sensitive coastal sage scrub habitats, contributing to increased fire frequency and intensity leading to type conversion of these habitats into annual grasslands. Deeply buried black mustard seeds may remain viable for as much as 50 years under field conditions (DiTomaso and Healy 2007).

Control:

Prevention: Disturbance and fire favor establishment of these mustard species. Additionally, shortpod mustard may be more likely to invade areas already dominated by annual grasses (Brooks 2004). Therefore, protection and sound management of remaining bunchgrass grasslands and quick eradication of initial infestations in scrub- or woodlands is recommended.

Mechanical: Black and shortpod mustard are best controlled mechanically by hand-pulling of plants each year after they have bolted but before they produce seed. The plants have a fairly weak root system, and as annuals, do not re-sprout from root fragments left in the soil. Over time, this can deplete the seed banks and allow native or grassy vegetation to dominate previously infested areas. Mowing, particularly when timing is poor, can produce plants that branch heavily from the base, and could produce even more seed than undisturbed plants.

Fire Management: Burning is not recommended for shortpod mustard control as it can damage co-occurring native vegetation due to heavy fuel loads, as well as the fact that shortpod and other exotic mustard species appear to be somewhat fire-adapted and can increase in density following fires.

Herbicide: Because early season mustards such as these emerge early in the growing season, often before native vegetation has broken dormancy, it is thought that early post-emergence herbicidal treatments may be effective for members of this group (Bossard et al. 2000), but more research is needed to develop a standardized, optimized methodology for control of these species.

Tree Tobacco (Nicotiana glauca)

Cal-IPC Pest Rating: Moderate.

Present at the project site: Yes.

This species occurs in a single location along Cheseboro Road downstream of the dam structure.

Description:

Tree tobacco is a shrub or tree in the nightshade family (*Solanaceae*), native to South America. Leaves and other structures of this species contain the highly toxic alkaloid anabasine, which can cause fetal deformities or even death in livestock that graze the plants. Tree tobacco occurs on sandy or gravelly soils, usually near streams, lakes, or ditches, although the plants are extremely drought tolerant and can withstand long periods of hot, dry weather (Guertin and Halvorson 2003). Tree tobacco plants are short-lived and the species does not appear to produce dense infestations in California (Cal-IPC, 2012), although the species is spreading throughout lower elevations of Arizona and California. While toxic to livestock, the plant is beneficial for native species such as hummingbirds and hawkmoths. Little is known about specifics of reproduction in this species, and optimal control methods are still being developed.

Control:

Prevention: In Australia, it has been observed that stem densities are significantly reduced in non-grazed plots, possibly due to the competition from native wetland vegetation (Florentine and Westbrooke 2005). As wetland areas are often grazed heavily by livestock in arid areas, protection of native emergent wetland vegetation by excluding livestock from sensitive areas may prevent seedling establishment or spread of existing infestations.

Mechanical: No mechanical methods of control other than hand-pulling are known, although cutting before herbicide application is an accepted control method for many weedy, woody species.

Herbicide: Optimal methods for control are still being developed, but glyphosate applied as foliar spray, drizzle, or as a treatment to cut-stumps all showed high levels of initial success when applied in fall (Oneto et al. 2004), although later regrowth was not assessed and other timing regimes were not compared in the 2004 publication.