

# Noxious Weed Management and Revegetation Plan

Lassen Lodge Hydroelectric Project  
FERC License No. 12496  
South Fork Battle Creek  
Tehama County, California



Prepared for:



**RUGRAW, LLC**

16464 Plateau Circle  
Redding, CA 96001

August 2014

Prepared by:



19803 North Creek Parkway  
Bothell, WA 98011

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## ACRONYMS AND ABBREVIATIONS

BMPs	best management practices
Cal-IPC	California Invasive Plant Council
CDFA	California Department of Agriculture
FERC	Federal Energy Regulatory Commission
PG&E	Pacific Gas and Electric
Project	Lassen Lodge Hydroelectric Project
ROW	right-of-way
SPI	Sierra Pacific Industries

## 1. INTRODUCTION AND PROJECT AREA

Rugraw, LLC proposes to construct a small hydroelectric project, the Lassen Lodge Hydroelectric Project (Project), which will have an installed capacity of 5 megawatts or less in Tehama County, California. The hydroelectric portion (e.g., diversion works, pipeline and penstock, powerhouse) of the Project is sited on the upper South Fork Battle Creek on the western slopes of the Cascade Range, approximately 1.5 miles west of the town of Mineral, an unincorporated community in Tehama County. These Project elements are located primarily on the south bank of South Fork Battle Creek between elevations of 3,417 feet and 4,310 feet above mean sea level. Power generated from the Project will be transmitted by a new, approximately 12-mile-long, 60-kilovolt (kV) transmission line to the Pacific Gas and Electric (PG&E) Volta-South line in the town of Manton, California. The Project, with the exception of approximately 1.5 miles of transmission line located within the Tehama County road right-of-way (ROW), will be located entirely on private land, including significant portions of land owned and operated by Sierra Pacific Industries (SPI) for logging operations.

## 2. PURPOSE

The purpose of this Noxious Weed Management and Revegetation Plan (Plan) is to prescribe methods to prevent and control the potential spread of noxious weeds during and following construction of the proposed Project and to reestablish vegetation in areas temporarily disturbed by construction of the Project.

Revegetation of areas temporarily disturbed by construction of the Project will not only help minimize spread of noxious weeds, but it also will help begin the process of restoring temporarily disturbed areas to a condition similar to that prior to construction. Revegetation will also help minimize potential for long-term erosion and sedimentation into streams and drainages in the area.

Invasive plants and noxious weeds pose threats to native ecosystems by displacing native species and altering habitat characteristics. "Noxious weed" is a legal term meaning any plant officially designated or declared by a federal, state, or local agency as injurious to public health, agriculture, recreation, wildlife, or property (Sheley and Petroff 1999). The California Department of Food and Agriculture (CDFA) and the California Invasive Plant Council (Cal-IPC) have developed lists of noxious weeds in the State of California (CDFA 2013). The CDFA designates plants as noxious weeds "if the plant is found to be "troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate" (CDFA 2013). The CDFA is primarily concerned with

rangelands and agricultural weeds. The Cal-IPC defines invasive plants as “plants that are not native to, yet can spread into, wildland ecosystems and that also displace native species, hybridize with native species, alter biological communities or alter ecosystem processes” (Cal-IPC 2014). The Cal-IPC list highlights non-native plants that are serious problems in wildlands. Cal-IPC categorizes invasive plants as “high”, “moderate”, or “limited” based on factors including their impact to ecological systems. For purposes of this Plan, the term “noxious weed” is used for both invasive plants and noxious weeds and is defined as those plants listed by the CDFA and categorized as “high” or “moderate” by the Cal-IPC.

## 2.1 GOALS AND OBJECTIVES

The goal of this Plan is to provide methods to prevent spread of noxious weeds during Project construction and control target noxious weeds following cessation of construction activities. The focus of noxious weed prevention and control efforts will be to prevent and control the spread of new infestations of noxious weeds resulting from construction of the Project. Rugraw, LLC is only responsible for the control of noxious weeds that are a result of construction-related, surface-disturbing activities. Rugraw, LLC is not responsible for noxious weeds that occur adjacent to Project areas or for controlling or eradicating infestations of noxious weeds in the Project area that were present prior to the Project. For example, yellow star thistle (*Centaurea solstitialis*) is widespread across many portions of the Project area. Eradication of these existing infestations is not the responsibility of Rugraw, LLC and would not be attempted.

## 3. NOXIOUS WEED INVENTORY

A noxious weed inventory of the Project area was conducted in May, June, and September, 2013. Prior to conducting the field inventory, a desktop and literature review of relevant information was conducted. Information reviewed included:

- Cal-IPC’s Invasive Plant Inventory (Cal-IPC 2013a);
- Cal-IPC’s Cal WeedMapper database (Cal-IPC 2013b);
- CDFA’s Noxious Weed List (CDFA 2013); and
- Prior biological surveys of the hydroelectric portion of the Project (Contour Botanical Consulting 1995, Shasta Land Management Consultants 1996, and Dittes and Guardino Biological Consulting 2002, Dittes and Guardino Consulting 2012)

Review of Cal-IPC’s Cal WeedMapper database (Cal-IPC 2013b) for the vicinity of the Project identified 60 noxious weeds known to occur in the area (see Appendix C of the *Botanical Resources Study Report* prepared for this Project). This includes 11 species rated as “high”, 29 species rated as “moderate”, and 20 species rated as “limited”.

Thirty-two noxious weed species were observed during the noxious weed inventory of the Project area, including 5 species ranked as “high”, 15 ranked as “moderate”, and 12 ranked as “limited” by Cal-IPC. Appendix A lists these species and briefly describes their locations and abundance in the Project area (see the *Botanical Resources Study Report* prepared for this Project for further discussion of methods and results of field inventory surveys).

Noxious weeds were most common in annual grassland and disturbed/developed habitats but were also observed in almost all vegetation communities in the Project area. Although noxious weeds were found in the majority of the Project area, the heaviest infestations were found in the western and west-central portions of the Project area along the transmission line ROW. The most abundant and/or widespread noxious weeds observed in the Project area include yellow star thistle, Himalayan blackberry (*Rubus armeniacus*), medusa head (*Elymus [Taeniatherum] caput-medusae*), common wild oats (*Avena fatua*), bull thistle (*Cirsium vulgare*), annual dogtail (*Cynosorus echinatus*), cheatgrass (*Bromus tectorum*), and rattail sixweeks grass (*Festuca [Vulpia] myuros*) (See Appendix A).

## 4. NOXIOUS WEED MANAGEMENT

### 4.1 PREVENTION

Mitigation measures and Best Management Practices (BMPs) will be implemented during construction of the Project to minimize the potential for introduction and spread of noxious weeds. These measures and BMPs include:

- Limiting ground-disturbing activities and vegetation clearing to the smallest footprint possible, while allowing for safe construction of the Project.
- Delineating limits of construction, work areas, and multipurpose areas with flagging, fencing, and/or stakes, and prohibiting ground disturbance outside of these limits.
- Preserving vegetation in place to the extent possible.
- Thoroughly cleaning all construction equipment and clothing before entering the Project area to reasonably ensure that seeds and propagules of noxious weeds are not introduced.
- Revegetating temporarily disturbed areas as soon as possible after conclusion of ground-disturbing activities with agency-approved, certified weed-free seed mixes (see Section 5).
- Using certified weed-free straw, hay, and mulch for all construction, erosion control, and restoration needs.

- Restricting travel to established roads and avoid entering areas with existing populations of noxious weeds when possible. Conduct work in un-infested areas first whenever possible. Clean equipment that has been used in weed-infested areas before moving to other areas.

## 4.2 CONTROL

Treatment of noxious weeds will occur in portions of the Project area where ground was temporarily disturbed by construction activities. Noxious weed control will occur following construction and will continue for two years post-construction. Methods to control noxious weeds may include mechanical (e.g., hand removal, mowing, disking) or chemical measures (e.g., herbicides) and will take into account the specific species being controlled and size of infestation. Control methods will also occur during the appropriate time of year to result in the most effective control of target noxious weeds. Noxious weeds to be controlled include species with a Cal-IPC invasiveness rating of “high” and “moderate”. Table 4-1 lists those species that will likely be targeted for control as these species were observed during the noxious weed inventory of the Project area.

Herbicide applications would comply with label restrictions, federal, state and/or county regulations, and landowner agreements. No spraying would occur prior to notification of the applicable land management agency. No herbicide would be applied to any private property without written approval of the landowner. Documentation of noxious weed control efforts will include: the species controlled, control methods used (including herbicide type, where applicable, and the size of the area controlled. this documentation will allow the efficacy of control methods to be assessed during noxious weed monitoring (see Section 5).

**Table 4-1.** List of Noxious Weeds Targeted for Control

Scientific Name	Common Name	Noxious Weed Rating <sup>1/</sup>	Locations and Abundance
<i>Avena fatua</i>	common wild oats	moderate	Observed in many vegetation communities, although most abundant in annual grassland and blue oak woodland communities. Abundant and widespread in the western portion of the Project area. Often found in dense patches.
<i>Bromus diandrus</i>	ripgut brome	moderate	Observed in many vegetation communities in the western and west-central portions of the Project area. Most abundant in annual grassland and disturbed/developed areas. Although found in dense patches, this species was not as common as other noxious brome species.



**Table 4-1.** List of Noxious Weeds Targeted for Control (continued)

Scientific Name	Common Name	Noxious Weed Rating <sup>1/</sup>	Locations and Abundance
<i>Bromus madritensis</i> <i>ssp. rubens</i>	red brome	high	Observed in many vegetation communities in the western and west-central portion of Project area. Although found in dense patches, this species was not as common as other noxious brome species.
<i>Bromus tectorum</i>	cheatgrass	high	Observed in many vegetation communities. Abundant and widespread, especially in the central and western portions of the Project area. Also found in more disturbed areas in the eastern portion of the Project area.
<i>Centaurea melitensis</i>	toocalote	moderate	Traces observed in annual grassland, chaparral, and blue oak communities in the west-central portion of the project area.
<i>Centaurea solstitialis</i>	yellow star thistle	high	Observed in many vegetation communities, especially in the west-central and western portions of the Project area. Abundant, widespread, and often found in dense patches in these areas.
<i>Cirsium arvense</i>	Canada thistle	moderate	Only observed in one location, along the station service line in the eastern portion of the Project area.
<i>Cirsium vulgare</i>	bull thistle	moderate	Traces found scattered in various vegetation communities along the length of the Project area. Occasionally found in dense patches, particularly in the eastern portion of the Project area.
<i>Cynosurus echinatus</i>	annual dogtail	moderate	Observed in many vegetation communities. Abundant and widespread in the west-central and western portions of the Project area. Also found in more disturbed areas in the eastern portion of the Project area. Often found in dense patches.
<i>Elymus</i> <i>(Taeniatherum)</i> <i>caput-medusae</i>	medusa head	high	Observed in many vegetation communities in the western and west-central portions of the Project area. Abundant and widespread in the western portion of the Project area. Often found in dense patches.
<i>Hirschfeldia incana</i>	Mediterranean hoary mustard	moderate	Traces observed in annual grassland in the western portion of the Project area.
<i>Holcus lanatus</i>	velvetgrass	moderate	Scattered patches observed in Sierran mixed conifer forest and riverine-montane riparian communities in eastern portion of Project area and in riparian, wetland, annual grassland, and Himalayan blackberry communities in west-central portion of Project area.
<i>Hordeum murinum</i>	foxtail barley	moderate	Traces observed in various vegetation communities in the western and west-central portion of the Project area.
<i>Hypericum perforatum</i>	common St. Johnswort	moderate	Observed in various vegetation communities primarily in the western and west-central portion of the Project area. Occasionally found in dense patches.

**Table 4-1.** List of Noxious Weeds Targeted for Control (continued)

Scientific Name	Common Name	Noxious Weed Rating <sup>1/</sup>	Locations and Abundance
<i>Leucanthemum vulgare</i>	oxeye daisy	moderate	Traces observed in annual grassland and disturbed/developed areas in the western portion of the Project area.
<i>Mentha pulegium</i>	pennyroyal	moderate	Traces observed along intermittent stream channels in the west-central portion of the Project area.
<i>Rubus armeniacus</i>	Himalayan blackberry	high	Primarily found in annual grassland, developed/disturbed, and riparian vegetation communities in the central and western portions of the Project area. An especially dense infestation was observed in the west-central portion of the Project area.
<i>Rumex acetosella</i>	sheep sorrel	moderate	Traces observed scattered primarily in annual grassland and disturbed areas in the western and west-central portion of the Project area.
<i>Torilis arvensis</i>	hedge parsley	moderate	Traces observed in the west-central and western portion of the Project area.

1/ Species ratings from Cal-IPC 2013a:

**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.

## 5. REVEGETATION

### 5.1 APPLICATION OF SEED MIX

Agency approved seed mixes will be applied to all areas of temporary disturbance as soon as possible following cessation of construction activities. Seed mixes will include primarily native grass and forb species, but may also include native shrub species. Final composition of seed mixes will be determined based on consultation with state and local agencies, but will likely include two different mixes: one for the more mesic habitats (e.g., Sierran mixed conifer habitat) disturbed for construction of components including the pipeline and penstock route and multipurpose areas along the eastern portion of the Project area and a more xeric seed mix for revegetation of disturbed areas in drier habitats (e.g., chaparral and oak woodland communities) which typically occur along the western portions of the Project area in areas that would potentially be disturbed for construction of the transmission line.

Seed mixes will be applied either via hydroseeding or through dry broadcast, depending on the time of year of application. Seed will not be applied between June 1<sup>st</sup> and August 31<sup>st</sup> to avoid

the need for supplemental irrigation. Supplemental seeding will be repeated if determined necessary during annual monitoring (see Section 6).

## 5.2 RIPARIAN REVEGETATION

The area associated with South Fork Battle Creek in the Project area consists primarily of steep slopes, large boulders, and rocky soils that prevent extensive riparian habitat from developing in much of this area and much of the riparian area within the proposed construction corridor consists of large boulders. Where riparian habitat has developed, dominant woody species observed along the creek bed and bank itself include white alder (*Alnus rhombifolia*) and scattered willows (*Salix* sp.). Other woody species include Pacific dogwood (*Cornus nuttallii*) and the occasional black cottonwood (*Populus trichocarpa*) and big leaf maple (*Acer macrophyllum*) trees. Other woody species include observed include thimbleberry (*Rubus parviflorus*), and California greenbrier (*Smilax californica*). Herbaceous species include torrent sedge (*Carex nudata*), slender hairgrass (*Deschampsia elongata*), mugwort (*Artemisia douglasiana*), musk monkeyflower (*Mimulus moschatus*), and American brooklime (*Veronica americana*).

Species to be planted in riparian areas disturbed during construction include: sandbar willow (*Salix exigua*), red willow (*Salix laevigata*), and white alder. Willow stakes will be used for revegetation of willow species and bare root or container stock will be used for installation of white alder individuals. The final quantities of each species to be installed will be determined based on acres of suitable planting substrate located within riparian areas temporarily disturbed by construction activities.

## 6. MONITORING

Following construction, a monitoring program will be implemented to help evaluate the effectiveness of noxious weed prevention and control measures and the success of revegetation efforts.

### 6.1 NOXIOUS WEED MONITORING

Post-construction noxious weed monitoring will be implemented annually for 2 years following completion of construction and will include all areas where noxious weed control treatments and/or ground disturbance has occurred. Monitoring will occur in late spring to late summer, when noxious weeds are still identifiable, beginning in the first year following construction. Monitoring will assess the effectiveness of prevention and control measures, document new occurrences of noxious weeds within areas disturbed by construction, and assess whether additional noxious weed control is necessary.

Data collected during annual monitoring will include locations of noxious weed infestations, an estimate of percent cover of noxious weeds, and qualitative assessment of efficacy of any noxious weed control treatments applied. Percent cover of noxious weeds will be used to evaluate the success of weed prevention and control activities. Desired percent cover of target noxious weeds (see Table 4-1 above) in temporarily disturbed construction areas is less than 20 percent during Year 1 monitoring and less than 10 percent in Year 2 monitoring.

## 6.2 REVEGETATION MONITORING

Concurrent with noxious weed monitoring, all revegetated areas will be monitored annually for two years to assess successful establishment of desired vegetation and to determine if additional seed mix and or riparian plantings need to be installed. In seeded areas, desired percent cover of seeded herbaceous species is at least 40 percent after year one and at least 70 percent after 2 years. If, at the conclusion of the second year of monitoring, significant patches of bare ground exist, the area will be reseeded. Monitoring of revegetated riparian areas will include measuring survival of installed plants. Desired survival of installed riparian plants is 90 percent during Year 1 monitoring and 80 percent during Year 2 monitoring.

## 7. SCHEDULE AND COST

**Table 5-1.** Noxious Weed Management and Revegetation Schedule and Cost

<b>Action</b>	<b>Schedule</b>	<b>Cost</b>
<b>Noxious Weed Management</b>		
Implementation of prevention measures (including BMPs)	Prior to and during construction	Included as part of construction activities
Noxious weed monitoring and supplemental control	Annually between late spring to early fall for 2-years post-construction	\$5,000/year
<b>Revegetation</b>		
Revegetation of temporarily disturbed areas with seed mixes	Immediately upon completion of construction activities	\$35,000
Installation of riparian plantings	During late fall or early spring immediately after completion of construction activities along South Fork Battle Creek	Dependent on whether riparian plantings are required and extent of riparian area to be revegetated
Revegetation monitoring	Annually during the growing season (between late spring to early fall) for 2-years post-construction	\$2,000/year

## 8. REFERENCES

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**APPENDIX A**

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**NOXIOUS WEEDS OBSERVED IN THE PROJECT AREA**

**Table A-1.** Listed Noxious Weeds Observed within the Project Area

Scientific name	Common Name	Noxious Weed Rating (Cal-IPC/CDFA) <sup>1/</sup>	Locations and Abundance
<b>Species with a Cal-IPC<sup>1/</sup> rating of High or Moderate</b>			
<i>Avena fatua</i>	common wild oats	moderate	Observed in many vegetation communities, although most abundant in annual grassland and blue oak woodland communities. Abundant and widespread in the western portion of the Project area. Often found in dense patches.
<i>Bromus diandrus</i>	ripgut brome	moderate	Observed in many vegetation communities in the western and west-central portions of the Project area. Most abundant in annual grassland and disturbed/developed areas. Although found in dense patches, this species was not as common as other noxious brome species.
<i>Bromus madritensis</i> <i>ssp. rubens</i>	red brome	high	Observed in many vegetation communities in the western and west-central portion of Project area. Although found in dense patches, this species was not as common as other noxious brome species.
<i>Bromus tectorum</i>	cheatgrass	high	Observed in many vegetation communities. Abundant and widespread, especially in the central and western portions of the Project area. Also found in more disturbed areas in the eastern portion of the Project area.
<i>Centaurea melitensis</i>	tocalote	moderate / List C	Traces observed in annual grassland, chaparral, and blue oak communities in the west-central portion of the project area.
<i>Centaurea solstitialis</i>	yellow star thistle	high/List C	Observed in many vegetation communities, especially in the west-central and western portions of the Project area. Abundant, widespread, and often found in dense patches in these areas.
<i>Cirsium arvense</i>	Canada thistle	moderate/List B	Only observed in one location, along the station service line in the eastern portion of the Project area.
<i>Cirsium vulgare</i>	bull thistle	moderate/List C	Traces found scattered in various vegetation communities along the length of the Project area. Occasionally found in dense patches, particularly in the eastern portion of the Project area.

**Table A-1.** Listed Noxious Weeds Observed within the Project Area (continued)

Scientific name	Common Name	Noxious Weed Rating <sup>1/</sup>	Locations and Abundance
<i>Cynosurus echinatus</i>	annual dogtail	moderate	Observed in many vegetation communities. Abundant and widespread in the west-central and western portions of the Project area. Also found in more disturbed areas in the eastern portion of the Project area. Often found in dense patches.
<i>Elymus (Taeniatherum) caput-medusae</i>	medusa head	high/List C	Observed in many vegetation communities in the western and west-central portions of the Project area. Abundant and widespread in the western portion of the Project area. Often found in dense patches.
<i>Festuca (Vulpia) myuros</i>	Rattail sixweeks grass	moderate	Observed in many vegetation communities along the entire length of the Project area. More common in the central and western portions of the Project area. Abundant, widespread, and often found in dense patches.
<i>Hirschfeldia incana</i>	Mediterranean hoary mustard	moderate	Traces observed in annual grassland in the western portion of the Project area.
<i>Holcus lanatus</i>	velvetgrass	moderate	Scattered patches observed in Sierran mixed conifer forest and riverine-montane riparian communities in eastern portion of Project area and in riparian, wetland, annual grassland, and Himalayan blackberry communities in west-central portion of Project area.
<i>Hordeum murinum</i>	foxtail barley	moderate	Traces observed in various vegetation communities in the western and west-central portion of the Project area.
<i>Hypericum perforatum</i>	common St. Johnswort	moderate/List C	Observed in various vegetation communities primarily in the western and west-central portion of the Project area. Occasionally found in dense patches.
<i>Leucanthemum vulgare</i>	oxeye daisy	moderate	Traces observed in annual grassland and disturbed/developed areas in the western portion of the Project area.
<i>Mentha pulegium</i>	pennyroyal	moderate	Traces observed along intermittent stream channels in the west-central portion of the Project area.



**Table A-1.** Listed Noxious Weeds Observed within the Project Area (continued)

Scientific name	Common Name	Noxious Weed Rating <sup>1/</sup>	Locations and Abundance
<i>Rubus armeniacus</i>	Himalayan blackberry	high	Primarily found in annual grassland, developed/disturbed, and riparian vegetation communities in the central and western portions of the Project area. An especially dense infestation was observed in the west-central portion of the Project area.
<i>Rumex acetosella</i>	sheep sorrel	moderate	Traces observed scattered primarily in annual grassland and disturbed areas in the western and west-central portion of the Project area.
<i>Torilis arvensis</i>	hedge parsley	moderate	Traces observed in the west-central and western portion of the Project area.
Species with a Cal-IPC rating <sup>1/</sup> of Limited			
<i>Bromus hordeaceus</i>	soft brome	limited	Observed in many vegetation communities. Abundant and widespread, especially in the central and western portions of the Project area. Often found in dense patches.
<i>Dactylis glomerata</i>	orchard grass	limited	Traces observed in annual grassland, blue oak woodland habitats, and developed areas in the western end of Project area.
<i>Erodium cicutarium</i>	redstem filaree	limited	Observed in many vegetation communities in the western and central portions of the Project area.
<i>Lythrum hyssopifolia</i> ( <i>L. hyssopifolium</i> )	hyssop loosestrife	limited	Traces observed in the emergent wetland located in the central portion of the Project area.
<i>Marrubium vulgare</i>	horehound	limited	Traces observed in the west-central portion of the Project area.
<i>Medicago polymorpha</i>	bur medic	limited	Traces observed in annual grassland in the western portion of the Project area.
<i>Plantago lanceolata</i>	English plantain	limited	Scattered populations observed, primarily found associated with wetland and riparian areas; however, also observed in annual grassland communities and in disturbed/developed areas.
<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky bluegrass	limited	Observed near emergent wetland and intermittent channel in the west-central portion of the Project area.
<i>Polypogon monspeliensis</i>	rabbitsfoot grass	limited	Scattered patches observed in and along intermittent channels in the west-central portion of the Project area.

**Table A-1.** Listed Noxious Weeds Observed within the Project Area (continued)

Scientific name	Common Name	Noxious Weed Rating <sup>1/</sup>	Locations and Abundance
<i>Rumex crispus</i>	curly dock	limited	Scattered patches observed in annual grassland and disturbed/developed areas in the western portion of the Project area.
<i>Trifolium hirtum</i>	rose clover	limited	Observed in many vegetation communities. Primarily observed in central and western portions of the Project area, although also observed in disturbed areas in the eastern portion of Project area. Abundant and often found in dense patches.
<i>Verbascum thapsus</i>	common mullein	limited	Scattered patches observed in various vegetation communities in the western portion of the Project area as well as in disturbed areas in the eastern portion of the Project area.

1/ Species ratings from Cal-IPC (2013a):

**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.

Species ratings from CDFA 2013:

**"A"** - a pest of known economic or environmental detriment and is either not known to be established in California or it is present in a limited distribution that allows for the possibility of eradication or successful containment. A-rated pests are prohibited from entering the state because, by virtue of their rating, they have been placed on the of Plant Health and Pest Prevention Services Director’s list of organisms “detrimental to agriculture” in accordance with the FAC Sections 5261 and 6461. The only exception is for organisms accompanied by an approved CDFA or USDA live organism permit for contained exhibit or research purposes. If found entering or established in the state, A-rated pests are subject to state (or commissioner when acting as a state agent) enforced action involving eradication, quarantine regulation, containment, rejection, or other holding action.

**"B"** - A pest of known economic or environmental detriment and, if present in California, it is of limited distribution. B-rated pests are eligible to enter the state if the receiving county has agreed to accept them. If found in the state, they are subject to state endorsed holding action and eradication only to provide for containment, as when found in a nursery. At the discretion of the individual county agricultural commissioner they are subject to eradication, containment, suppression, control, or other holding action.

**"C"** - A pest of known economic or environmental detriment and, if present in California, it is usually widespread. C-rated organisms are eligible to enter the state as long as the commodities with which they are associated conform to pest cleanliness standards when found in nursery stock shipments. If found in the state, they are subject to regulations designed to retard spread or to suppress at the discretion of the individual county agricultural commissioner. There is no state enforced action other than providing for pest cleanliness.