

## 4.1.6 Non-Native Invasive Plants Study

### 4.1.6.1 *Project Nexus*

Continued Project O&M and Project-related recreation activities may facilitate the spread of NNIP. For the purpose of this *NNIP Study*, an NNIP is a plant species that is listed as “A”, “B”, or “C” by the CDFA (CDFA 2010). Other NNIP of interest include species of concern to ANF and LNPF that are not rated by the CDFA.

### 4.1.6.2 *Existing Information and Need for Additional Information*

Existing, relevant, and reasonably available information regarding NNIP known or with the potential to occur within the proposed Project boundary is provided in Section 4.6 and Section 4.7 of the Licensees’ PAD. As a summary, the Licensees found that no comprehensive NNIP surveys have been performed recently in the proposed Project boundary. A list of NNIP species with potential to occur in the Study Area was identified in the Licensees’ PAD. Based on input from USFS and CDFW, the Licensees identified a revised list of target NNIP to focus on during field surveys (Table 4.1-4). This *NNIP Study* will augment existing information by providing current information regarding NNIP within the proposed Project boundary.

**Table 4.1-4. Target NNIP Species to Survey in the Study Area**

| Scientific Name                    | Common Name          | CDFA |
|------------------------------------|----------------------|------|
| ** <i>Acacia</i> sp.               | Acacia               | B    |
| ** <i>Acroptilon repens</i>        | Russian knapweed     | B    |
| * <i>Ageratina adenophora</i>      | Eupatory             |      |
| ** <i>Ailanthus altissima</i>      | Tree of heaven       | C    |
| ** <i>Arundo donax</i>             | Giant reed grass     | B    |
| ** <i>Asphodelus fistulosus</i>    | Asphodel             | B    |
| * <i>Atriplex semibaccata</i>      | Saltbush             |      |
| * <i>Brassica tournefortii</i>     | African mustard      |      |
| ** <i>Cardaria draba/pubescens</i> | Hoary cress/Whitetop | B    |
| ** <i>Carduus pycnocephalus</i>    | Italian thistle      | C    |
| ** <i>Centaurea solstitialis</i>   | Yellow star thistle  | C    |
| ** <i>Centaurea maculosa</i>       | Spotted knapweed     | A    |
| ** <i>Centaurea melitensis</i>     | Tocalote             | C    |
| ** <i>Cirsium arvense</i>          | Canada thistle       | B    |
| ** <i>Cirsium vulgare</i>          | Bull thistle         | C    |
| * <i>Cistus creticus</i>           | rockrose             |      |
| * <i>Cnicus benedictus</i>         | blessed thistle      |      |
| * <i>Colutea arborescens</i>       | Bladderpod senna     |      |
| * <i>Conium maculatum</i>          | Poison hemlock       |      |

**Table 4.1-4. Target NNIP Species to Survey in the Study Area (continued)**

| Scientific Name                                      | Common Name           | CDFA |
|--|-----------------------|------|
| ** <i>Cortaderia jubata/selloana</i>                 | Pamapas grass         | B    |
| ** <i>Cynara cardunculus</i>                         | Artichoke thistle     | B    |
| * <i>Cynosurus echinatus</i>                         | Hedgehog dogtailgrass |      |
| ** <i>Cystisus scoparius</i>                         | Scotch thistle        | C    |
| ** <i>Delairea odorata</i>                           | German ivy            | B    |
| * <i>Dipsacus sativus</i>                            | Teasel                |      |
| * <i>Dimorphotheca sinuata</i>                       | African daisy         |      |
| * <i>Eichornia crassipes</i>                         | Water hyacinth        |      |
| * <i>Elaeagnus angustifolius</i>                     | Russian olive         |      |
| * <i>Erharta</i> sp.                                 | Veldtgrass            |      |
| * <i>Eucalyptus globulus</i>                         | Blue gum              |      |
| * <i>Euphorbia dendroides</i>                        | Tree spurge           |      |
| ** <i>Euphorbia terracina</i>                        | Geralton carnation    | B    |
| * <i>Ficus carica</i>                                | Fig                   |      |
| * <i>Foeniculum vulgare</i>                          | Fennel                |      |
| * <i>Fumaria officinalis</i>                         | Fumitory              |      |
| ** <i>Genista monospeulana</i>                       | French broom          | C    |
| ** <i>Halogeton glomeratus</i>                       | Halogeton             | A    |
| * <i>Hedera helix</i>                                | English ivy           |      |
| ** <i>Hydrilla verticillata</i>                      | Hydrilla              | A    |
| * <i>Lathyrus latifolius</i>                         | Perennial sweetpea    |      |
| ** <i>Lepidium latifolium</i>                        | Perennial pepperweed  | B    |
| ** <i>Linaria genistifolia</i> ssp. <i>dalmatica</i> | Dalmatian toadflax    | A    |
| * <i>Lobularia maritima</i>                          | sweet alyssum         |      |
| * <i>Marrubium vulgare</i>                           | horehound             |      |
| * <i>Nicotiana glauca</i>                            | Tree tobacco          |      |
| * <i>Olea europaea</i>                               | Olive                 |      |
| ** <i>Pennisetum clandestinum</i>                    | Kikuyu grass          | C    |
| * <i>Pennisetum setaceum</i>                         | Fountain grass        |      |
| * <i>Picris echioides</i>                            | Bristly ox-tongue     |      |
| * <i>Prunus cerasifera</i>                           | Cherry plum           |      |
| * <i>Pyracantha</i> sp. <i>pyracantha</i>            | Pyracantha            |      |
| * <i>Raphanus sativus</i>                            | Wild radish           |      |
| ** <i>Retama monosperma</i>                          | Bridal broom          | B    |
| * <i>Ricinus communis</i>                            | Castorbean            |      |
| * <i>Robinia pseudoacacia</i>                        | Black locust          |      |
| * <i>Rosemarinus officianalis</i>                    | Rosemary              |      |
| * <i>Rubus discolor</i>                              | Himalayan blackberry  |      |
| ** <i>Salsola tragus</i>                             | Russian thistle       | C    |

**Table 4.1-4. Target NNIP Species to Survey in the Study Area (continued)**

| Scientific Name                   | Common Name              | CDFA |
|-----------------------------------|--------------------------|------|
| ** <i>Salsola paulsenii</i>       | Barbwire Russian thistle | C    |
| * <i>Saponaria officinalis</i>    | Bouncing bet             |      |
| * <i>Schinus molle</i>            | Peruvian pepper tree     |      |
| * <i>Silybum marianum</i>         | Milk thistle             |      |
| ** <i>Spartium junceum</i>        | Spanish broom            | C    |
| * <i>Stipa miliacea</i>           | Smilo grass              |      |
| ** <i>Tamarix ramosissima</i>     | Saltcedar                | B    |
| * <i>Tradescantia fluminensis</i> | Small-leaved spiderwort  |      |
| ** <i>Tribulus terrestris</i>     | Puncture vine            | C    |
| * <i>Ulnus parvifolia</i>         | Chinese elm              |      |
| * <i>Vinca major</i>              | Periwinkle               |      |
| * <i>Washingtonia robusta</i>     | Mexican fan palm         |      |

Key: CDFA = California Department of Food and Agriculture

CDFA Ratings:

A - An organism of known economic importance subject to state (or commissioner when acting as a state agent) enforced action involving: eradication, quarantine regulation, containment, rejection, or other holding action.

B - An organism of known economic importance subject to: eradication, containment, control or other holding action at the discretion of the individual county agricultural commissioner. OR An organism of known economic importance subject to state endorsed holding action and eradication only when found in a nursery.

C - An organism subject to no state enforced action outside of nurseries except to retard spread. At the discretion of the county agricultural commissioner. OR An organism subject to no state enforced action except to provide for pest cleanliness in nurseries.

\*Full-datasets to be collected only on USFS land

\*\*Occurrence to be mapped wherever found

#### 4.1.6.3 Study Goals and Objectives

The goals of this *NNIP Study* are to: (1) identify and map the locations of NNIP in the study area for the *NNIP Study*; and (2) to collect ancillary data related to NNIP, including geographic extent of occurrences and/or number of individuals, and indications of the potential threats for NNIP to expand in the study area for the *NNIP Study*.

The objective of this *NNIP Study* is to gather sufficient data necessary to fill recognized gaps in existing information on the presence and extent of NNIP in the study area for the *NNIP Study*.

#### 4.1.6.4 Study Methods

##### Study Area

The study area for the *NNIP Study* will consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which the Licensees do not perform any Project O&M. This includes staging areas; construction areas; upstream maintenance areas above reservoirs; fuel modification requirement areas; areas cleared for access to transmission line poles and access routes to these areas; Lower Quail Canal, Quail Lake, and associated maintenance roads/areas and recreational features; and Gorman Bypass Channel and associated maintenance roads/areas. The study area

will also include a 100-foot buffer from all Project features where disturbance is expected to occur. The study area will extend beyond the proposed Project boundary to accommodate this buffer, where necessary. The study area for the *NNIP Study* is shown in Figure 4.1-11.

### **General Concepts and Procedures**

- Personal safety is the most important consideration of each fieldwork team. Fieldwork will only occur in safely accessible areas and under conditions deemed safe by the field crews. Locations within the study area that cannot be accessed in a safe manner (e.g., locations containing dense vegetation or unsafe slopes) and areas inundated when the surveys are performed, will not be surveyed; these areas will be identified in the data summary and an explanation for survey exclusion will be provided.
- The *NNIP Study* will begin after FERC issues its Study Plan Determination.
- The *NNIP Study* does not include the development of requirements for the new license, which will be addressed outside the Study process.
- This *NNIP Study* focuses specifically on non-native invasive plants within the proposed Project boundary, but the study area for the *NNIP Study* is specific to the areas that can support that resource.
- If required for the performance of the *NNIP Study*, the Licensees will make a good faith effort to obtain permission to access private property well in advance of initiating the *NNIP Study*. The Licensees will only enter private property if permission has been provided by the landowner.
- The Licensees will acquire all necessary agency permits and approvals prior to beginning fieldwork for the *NNIP Study*.
- Field crews may make variances to the *NNIP Study* in the field to accommodate actual field conditions and unforeseen problems. Any variances from the *NNIP Study* will be noted in the data resulting from the *NNIP Study*.
- To prevent the introduction and transmittal of amphibian chytrid fungus and invasive aquatic species (e.g., quagga mussels, zebra mussel, and Asian clams), field crews will be trained on, provided with, and use materials (e.g., Quat) for decontaminating their boots, waders, and other equipment when leaving or traveling between water-based study sites. Field crews will follow DWR's Quagga and Zebra Mussel Rapid Response Plan and CDFW's Aquatic Invasive Species Decontamination Protocol which can be found at the following link: (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=43333>). All boats used during the study will follow cleaning protocols, including inspections before and after use. All decontamination requirements in place at Project reservoirs

including those of DWR's *Quagga and Zebra Mussel Rapid Response Plan* for the SWP will be strictly followed (DWR 2010).



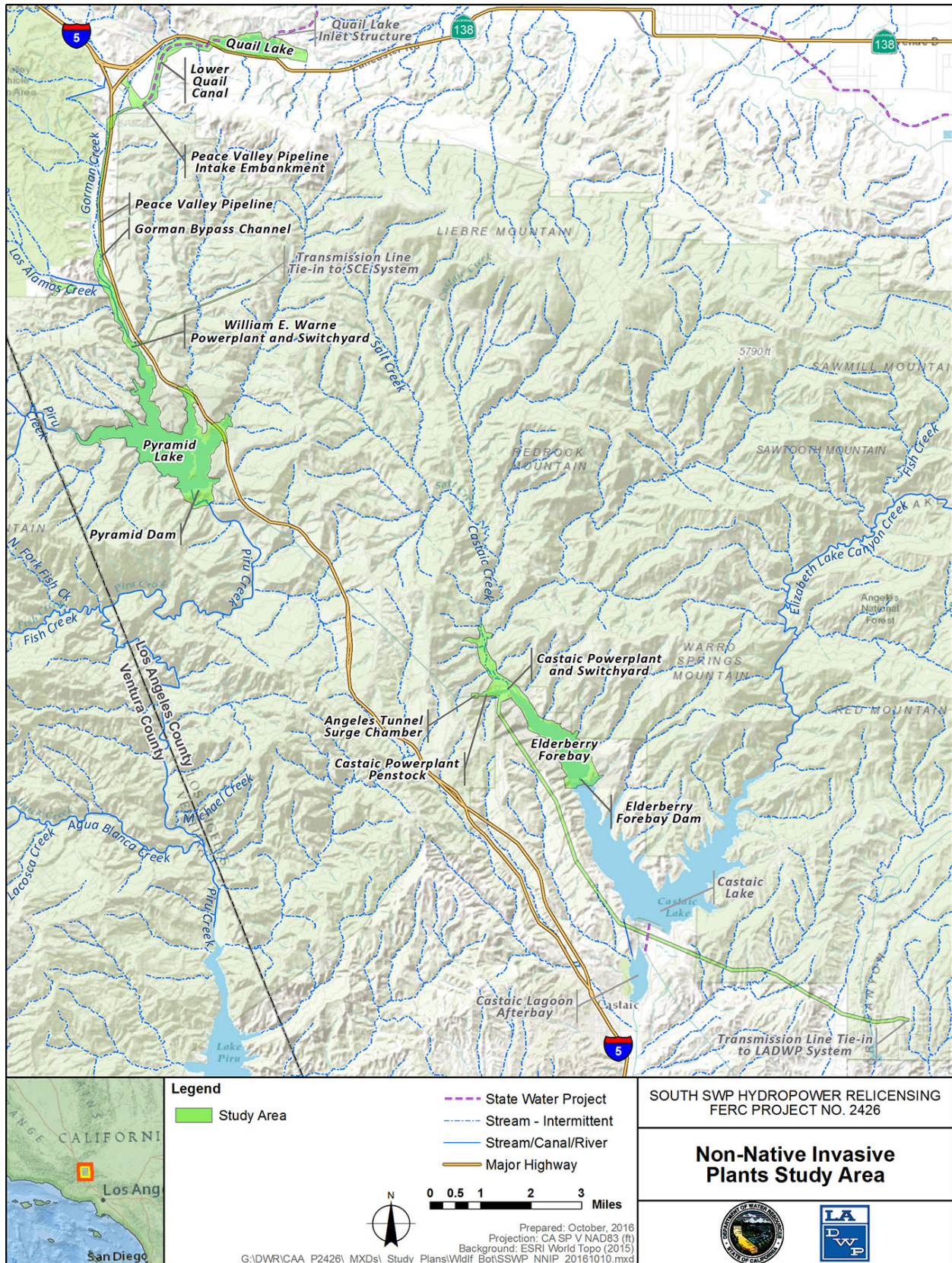


Figure 4.1-11. Non-Native Invasive Plants Study Area

## Methods

Fieldwork for the *NNIP Study* will be performed in conjunction with the Licensees' *Botanical Resource Study*, a separate study being undertaken as part of this relicensing effort, which includes a comprehensive floristic survey within the same study area. Floristic surveys require that all species encountered are identified to the extent necessary to determine listing status. The *NNIP Study* will consist of three steps: (1) gather data and prepare for field effort; (2) conduct field surveys; and (3) prepare data. These steps are described below.

Step 1 – Gather Data and Prepare for Field Effort. The Licensees will prepare field maps for use by survey teams. The maps will depict the study area on an aerial imagery base and will include the location of Project features. Pre-field planning activities will include preliminary identification of vegetation and habitats that could support NNIP.

Step 2 – Conduct Field Surveys. Surveys will follow applicable CDFW protocol methodology described in the botanical survey section of the CDFW *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. This protocol uses systematic sampling techniques to ensure thorough coverage of plant communities that could support NNIPs. The CDFW protocol states that “the level of effort required per given area and habitat is dependent upon the vegetation and its overall diversity and structural complexity, which determines the distance at which plants can be identified.” Staff will conduct surveys by walking all areas of the site that can be safely accessed to ensure thorough coverage, noting all plant taxa observed. When performing NNIP surveys on USFS lands, a qualified team of field staff will follow USFS protocols, excluding treatment protocols (USFS 2014). Special attention will be paid to disturbed areas, including road edges, recreation areas, and maintenance areas (i.e., target areas). Field staff will perform surveys that encompass the period within which most NNIP are expected to flower, with at least two survey visits performed in all target areas to maximize the likelihood of detection of NNIP. Surveyors will be botanists or scientists that are qualified to identify NNIPs likely to occur in the study area for the *NNIP Study*. Taxonomy and nomenclature will be based on *The Jepson Manual* (Baldwin et al. 2012).

Because the field survey will be floristic in nature, all species observed will be documented. More extensive data will be collected for target species in Table 4.1-4. For these species that are not listed by CDFA (identified with one asterisk in Table 4.1-4), data will be collected in accordance with USFS protocols (USFS 2014) for any occurrences on USFS lands. For species identified with two asterisks in Table 4.1-4, occurrence data will be collected wherever it is observed within the study area.

Two forms of noxious weed data will be collected and maintained, depending on the type and distribution of weeds located during survey efforts:

- Quantitative data: for discrete occurrences of weeds, data collected will include species, GPS-derived location, and other data, including percent cover, distribution, plant phenology, habitat description, and land use notes. For species



occurrences on USFS lands, data collection will follow USFS protocols (USFS 2014, 2015)

- Qualitative data: for widespread weeds, or for those weeds for which detailed mapping is unlikely to remain accurate (e.g., annual grasses, which change distributions yearly), the Licensees will describe general distribution and extent within the study area

**Step 3 – Prepare Data.** Following the surveys, the Licensees will develop GIS maps depicting NNIP population occurrences and Project facilities, features, and specific Project-related activities (e.g., hiking or picnicking) and other related information collected during the *NNIP Study*.

### **Quality Assurance and Quality Control**

Field data will be collected in a manner that promotes high quality results and will be subject to appropriate QA/QC procedures, including spot-checks of transcription and comparison of GIS maps with field notes to verify locations of NNIPs. QA/QC will also include measures to prevent spreading the NNIP by survey personnel.

### **Analysis**

Following the surveys, the Licensees will analyze the developed GIS maps and other relevant information collected during the *NNIP Study*.

### **Reporting**

*NNIP Study* results and other existing and relevant information will be included in the Licensees' ISR, USR, DLA, and FLA to the extent it has been completed at the time needed for each of the aforementioned relicensing milestones.

#### **4.1.6.5 Consistency of Methodology with Generally Accepted Scientific Practices**

This *NNIP Study* is generally consistent with the goals, objectives, and methods outlined for the most recent FERC hydroelectric relicensing efforts in California, including the Don Pedro Project (FERC No. 2299), the Yuba River Development Project (FERC No. 2246), and the Merced River Hydroelectric Project (FERC No. 2174), and uses standard botanical survey methods as defined by CDFW.

#### **4.1.6.6 Schedule**

The *NNIP Study* will begin after FERC issues its Study Plan Determination. The Licensees anticipate the schedule below will be followed to complete the *NNIP Study*.



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|                             |                              |
|-----------------------------|------------------------------|
| Fieldwork Preparation       | May 2017 – February 2018     |
| Fieldwork                   | June 2017 – April 2018       |
| Data QA/QC                  | July 2017 – September 2018   |
| Data Analysis and Reporting | October 2018 – December 2018 |

#### **4.1.6.7 Level of Effort and Cost**

Based on the work effort described above, the Licensees estimate that the current cost to complete this *NNIP Study* will range between \$224,000 and \$299,000.

#### **4.1.6.8 References**

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