APPENDIX D

Baseline Habitat Assessment

Memorandum

Task Order: 8—Project No. 6 Channel Maintenance

Date: 3 March 2015

To: Andrew Rogers

From: Matt Wacker, H. T. Harvey & Associates

Cc: Ramona Swenson, Environmental Science Associates
Eric Hansen, Consulting Environmental Biologist

Subject: **Final Baseline Conditions Assessment**

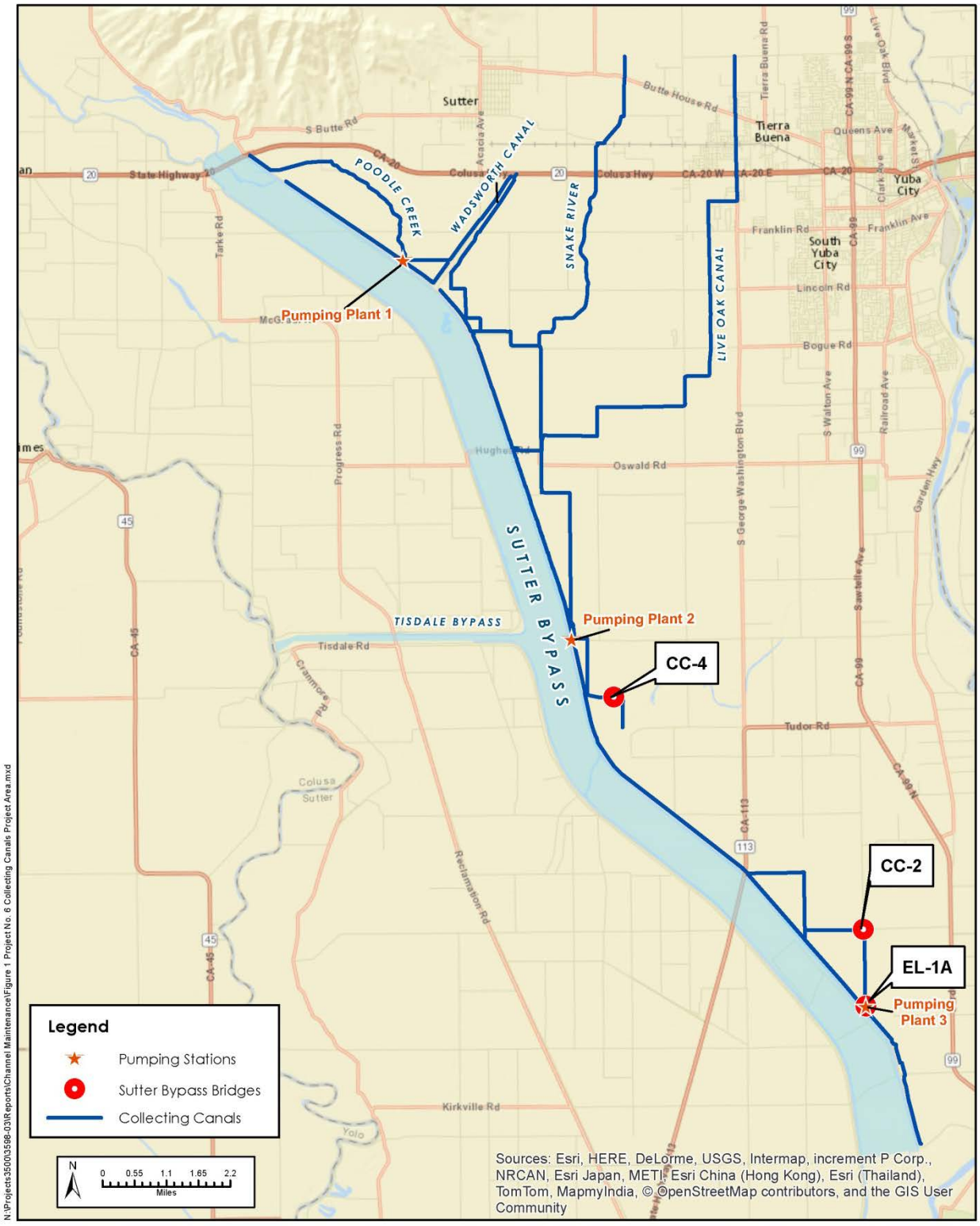
Introduction

To maintain channel capacity and minimize flood risk, the California Department of Water Resources (DWR) Flood Maintenance Office (FMO) is proposing to implement ongoing maintenance activities for Project No. 6, located in Sutter County. According to California Water Code Sections 8361 and 12878, Project No. 6 consists of the collecting canals, sumps, pumps, and structures of the drainage system east of the Sutter Bypass (Figure 1). These facilities are maintained by DWR's Sutter Maintenance Yard and are part of the Sacramento River Flood Control Project.

The proposed maintenance activities (referred to herein as the Project) comprise sediment removal from the collecting canals; bridge repair and maintenance; and pipe/culvert repair, replacement, or abandonment. These activities will take place within the Project No. 6 facilities and up to 200 feet around those facilities (referred to herein as the Project Area).

This memorandum presents an assessment of baseline conditions in the Project area, prepared for DWR by H. T. Harvey & Associates (HTH) under subcontract to Environmental Science Associates (ESA). This assessment will support a California Environmental Quality Act (CEQA) analysis and DWR's acquisition of associated State permits for the proposed maintenance activities. This baseline conditions assessment includes:

- a map of habitats in the Project area (showing potential wetland features and other habitat types) and
- an assessment of habitat suitability for the giant garter snake (GGS) (*Thamnophis gigas*) in the Project area.



Division of Flood Management
Flood Maintenance Office

Figure 1 Project No. 6 Collecting Canals Project Area
Project No. 6 Collecting Canals (3598-03)
March 2015

Habitat Mapping—Methods and Results

Habitat types were mapped throughout the entire Project area (Project No. 6 facilities plus a 200-foot buffer). Habitat types were categorized based on those described in the California Wildlife Habitat Relationships System (California Department of Fish and Wildlife [CDFW] 2014) and the California Native Plant Society's *Vegetation Alliances and Associations of the Great Valley Ecoregion* (Buck-Diaz et al. 2012). Additional habitat type descriptions were developed by HTH if needed to better characterize potential GGS habitat elements (U.S. Fish and Wildlife Service [USFWS] 1999) or to distinguish other features (e.g., levee toes and farm roads to be used during the Project) that are relevant to expected Project activities and to the characterization of the Project's potential environmental effects. Table 1 lists the habitat types identified in the Project area.

Habitat types were first mapped at a reconnaissance level using aerial photographs (U.S. Department of Agriculture [USDA] 2012) displayed in a geographic information system (GIS) at a scale of approximately 1:800. Then, during one day of field reconnaissance throughout the Project area, the visual signatures of habitat types observed on the aerial photographs were verified to refine the maps. Google Earth aerial imagery and street-view photographs (Google, Inc. 2014) were also used in the field and during mapping to supplement USDA aerial imagery. Depending on the habitat type, the resultant mapped polygons range in size from approximately 0.01 acre (e.g., pockets of freshwater emergent marsh lining canals) to several acres (e.g., large rice fields).

Habitat types that may include waters of the United States, wetlands, or riparian habitat subject to federal or State regulation are indicated in Table 1 (and collectively referred to as *potentially jurisdictional habitat*). These habitats may be subject to the jurisdiction of the U.S. Army Corps of Engineers (under Section 404 of the Clean Water Act) or the State of California (under Section 401 of the Clean Water Act and/or Section 1600 of the California Fish and Game Code). Habitats indicated as potentially jurisdictional habitat consist of those that:

- fall within the ordinary high-water mark (OHWM) of canals in the Project area,
- are located along channel banks,
- support vegetation typical of wetlands or riparian habitat, or
- exhibit hydrology typical of wetlands (e.g., ponded water).

These characteristics were observed during field reconnaissance and through interpretation of aerial photographs. Habitat maps were not prepared at a level of detail sufficient to formally identify potentially jurisdictional habitats under the applicable laws and regulations, nor are the maps supported by field data sufficient to allow this identification.

Attachment A includes habitat maps of the entire Project area.

Table 1. Habitat Types in the Project Area

Habitat Type	Habitat Description	Mapped Canopy Cover Classes[1]	Potentially Jurisdictional Habitat?	Acres
Annual grassland	Herbaceous community characterized by wild oats (*Avena* spp.) and other ruderal species. Found along levee slopes throughout the Project area.	n/a	No	307.2
Perennial grassland	Herbaceous community characterized by perennial grasses (e.g., *Elymus* spp.). Found along levee toes (apparently seeded) and in areas managed for natural habitat.	n/a	No	26.6
Ruderal	Herbaceous community characterized by mustards (e.g., *Brassica nigra, Hirschfeldia incana*), wild radish (*Raphanus* sp.), woolly mullein (*Verbascum thapsus*), milk thistle (*Silybum marianum*), Johnson grass (*Sorghum halepense*), Bermuda grass (*Cynodon dactylon*), vervain (*Verbena* sp.), and mugwort (*Artemesia douglasiana*). Found along channel banks and roadsides.	n/a	Some may be. Ruderal habitat is commonly located along banks of waterways potentially subject to CDFW jurisdiction.	420.6
Wet meadow	Herbaceous community characterized by short wetland plants such as nutsedges (*Cyperus* sp.) and rushes (*Juncus* spp.). Found in a few scattered locations adjacent to channels and freshwater emergent marsh.	n/a	Yes. Dominant vegetation and hydrology are typical of wetlands.	120.5
Freshwater emergent marsh	Herbaceous community characterized by tall wetland plants such as tules (*Schoenoplectus* spp.) and cattails (*Typha* spp.). Found in and adjacent to channels and lacustrine areas.	n/a	Yes. Dominant vegetation is typical of wetlands and may be located below the OHWM.	37.3

Table 1. Habitat Types in the Project Area

Habitat Type	Habitat Description	Mapped Canopy Cover Classes[1]	Potentially Jurisdictional Habitat?	Acres
Native riparian forest	Woody community characterized by trees such as Fremont cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), red willow (*S. laevigata*), occasional black walnut (*Juglans hindsii*), and valley oak (*Quercus lobata*) in the overstory, and riparian scrub species and Himalayan blackberry (*Rubus armeniacus*) in the understory. Found in a few scattered locations adjacent to channels.	S = 10–24% O = 25–39% M = 40–59% D = 60–100%	Yes. Dominant vegetation is typical of wetlands and riparian habitat; mostly located along banks of waterways potentially subject to CDFW jurisdiction.	30.7 (S = 1.9 O = 0.2 M = 0.7 D = 27.9)
Native riparian scrub	Woody community characterized by shrubs, including wild grape (*Vitis californica*), California rose (*Rosa californica*), sandbar willow (*S. exigua*), arroyo willow (*S. lasiolepis*), poison oak (*Toxicodendron diversilobum*), Himalayan blackberry, and occasional blue elderberry (*Sambucus nigra* ssp. *caerulea*) shrubs. Found scattered along some channel banks.	S = 10–24% O = 25–39% M = 40–59% D = 60–100%	Yes. Dominant vegetation is typical of wetlands and riparian habitat; mostly located along banks of waterways potentially subject to CDFW jurisdiction.	4.2 (M = 0.1 D = 4.1)
Nonnative riparian	Woody community dominated by invasive species such as black locust (*Robinia pseudoacacia*), tree of heaven (*Ailanthus altissima*), giant reed (*Arundo donax*), eucalyptus (*Eucalyptus* spp.), and saltcedar (*Tamarix* spp.). Found in a few locations scattered throughout the Project area.	S = 10–24% O = 25–39% M = 40–59% D = 60–100%	No.	3.4 (O = 0.1 D = 3.3)
Himalayan blackberry brambles	Stands of nonnative Himalayan blackberry, with occasional ruderal species and wild grape. Found along channel banks throughout the Project area.	S = 10–24% O = 25–39% M = 40–59% D = 60–100%	Yes. Located along banks of waterways potentially subject to CDFW jurisdiction.	33.2

Table 1. Habitat Types in the Project Area

Habitat Type	Habitat Description	Mapped Canopy Cover Classes[1]	Potentially Jurisdictional Habitat?	Acres
Perennial riverine	Channels composing the Project area, as well as other roadside and agricultural ditches, that convey flow throughout the year. Includes floating aquatic vegetation (e.g., nonnative water primrose [*Ludwigia* spp.] and parrot's feather [*Myriophyllum aquaticum*], duckweed [*Lemna* spp.], and mosquito fern [*Azolla* spp.]), which is present in most channels throughout the Project area and ranges from sparse to moderate in cover. (The location of floating aquatic vegetation changes frequently, depending on water level, flow, and season, so it was not mapped separately from riverine habitat.)	n/a	Yes. Located below the OHWM, and dominant vegetation (when present) is typical of wetlands.	199.7
Seasonal riverine	Channels that convey flow seasonally and do not support emergent or floating aquatic vegetation. These are located along Live Oak Canal.	n/a	Yes. Located below the OHWM.	11.1
Unvegetated banks	Some of the channel banks in the Project area appear to be kept free of vegetation, possibly through herbicide application by adjacent landowners. These banks are located along Live Oak Canal, mainly north of Bogue Road.	n/a	Yes. Located below the OHWM.	10.2
Lacustrine	Still, open water bodies. May include floating aquatic vegetation. Found in a few locations associated with channels.	n/a	Yes. Located below the OHWM, and dominant vegetation (when present) is typical of wetlands.	8.0
Rice	Agricultural fields dedicated to rice production. Very common throughout the Project area.	n/a	Yes. Dominant vegetation and hydrology are typical of wetlands.	1,038.2

Table 1. Habitat Types in the Project Area

Habitat Type	Habitat Description	Mapped Canopy Cover Classes[1]	Potentially Jurisdictional Habitat?	Acres
Irrigated row and field crops	Agricultural fields dedicated to production of row crops (e.g., tomatoes) and field crops (e.g., alfalfa). Found in a few locations scattered throughout the Project area.	n/a	No.	116.3
Fallow field	Agricultural fields not in production. Found in a few locations scattered throughout the Project area.	n/a	No.	61.0
Irrigated pasture	Grazing land irrigated to maintain grasses and forbs suitable for livestock foraging. Found in a few locations scattered throughout the Project area.	n/a	Yes. Dominant vegetation, and sometimes hydrology, is typical of wetlands.	98.3
Deciduous orchard	Agricultural lands dedicated to deciduous orchards (e.g., walnut, almond). Found mainly along Live Oak Canal.	S = 10–24% O = 25–39% M = 40–59% D = 60–100%	No.	152.9 (S = 22.6 O = 11.8 M = 46.4 D = 72.1)
Farm road	Dirt roads found along channels and agricultural lands. May be barren or may support some annual grassland or ruderal species.	n/a	No.	176.1
Toe road	Dirt roads found along levee toes and channels. Mostly barren.	n/a	No.	51.1
Developed	Paved or graveled roads, buildings, other structures, and associated landscaped areas. Found throughout the Project area.	n/a	No.	273.6

Sources: Buck-Diaz et al. 2012; CDFW 2014.
Key: OHWM = Ordinary high-water mark.
Notes:
[1] n/a = not applicable to this habitat type; D = Dense; M = Moderate; O = Open; S = Sparse.

Giant Garter Snake Habitat Suitability Assessment—Methods and Results

In coordination with consulting environmental biologist Eric Hansen, HTH assessed whether Project No. 6 canals and surrounding land (i.e., the 200-foot-wide buffer on either side of each Project No. 6 facility) are likely to provide suitable habitat for GGS. The habitat suitability assessment identified Project canal segments of two types: *likely* GGS habitat and *not likely* GGS habitat. Canal segments were assessed at a landscape level and assigned a suitability type in 0.5-mile-long increments.

Suitability was assessed using the habitat maps presented above. The one-day field reconnaissance of the Project area, HTH's review of recorded sightings of GGS in the region (California Natural Diversity Database [CNDDB] 2014), and conversations with Eric Hansen (Hansen pers. comm.) further informed the categorization of potential GGS habitat.

GGS prefer the following habitat elements, found in the Project area:

- open, perennial water and floating aquatic or emergent herbaceous vegetation for cover, foraging, breeding, and dispersal;
- herbaceous vegetation on the channel banks and adjacent land for cover and basking;
- upland refuge provided by desiccation cracks, rodent burrows, or revetment; and
- mud- and silt-bottomed channels.

The result of the habitat suitability assessment is that most of the Project area provides likely habitat for GGS. Most of the Project area is located in a landscape of rice fields, which offer open water and emergent herbaceous vegetation during the snake's active season. The rice fields are interspersed with mud- or silt-bottomed, perennially wet canals that support floating aquatic or emergent herbaceous vegetation in the channel and herbaceous vegetation on the banks. Farm and toe roads adjacent to the canals and rice fields provide some of the only upland refuge in the Project area and thus are likely to be used by GGS. Additionally, GGS are common throughout the surrounding Sutter Basin (CNDDB 2014), increasing the probability that GGS would occur in suitable habitats in the Project area.

One segment of the Project area represents not likely GGS habitat: Live Oak Canal between Lincoln Road and Pease Road. North of Lincoln Road, the channel and banks of Live Oak Canal are mostly devoid of vegetation, and the canal is surrounded by orchards and residences. It also appears to contain water less consistently than the canals interspersed among the rice fields in the majority of the Project area.

These results are depicted on Figure 2.

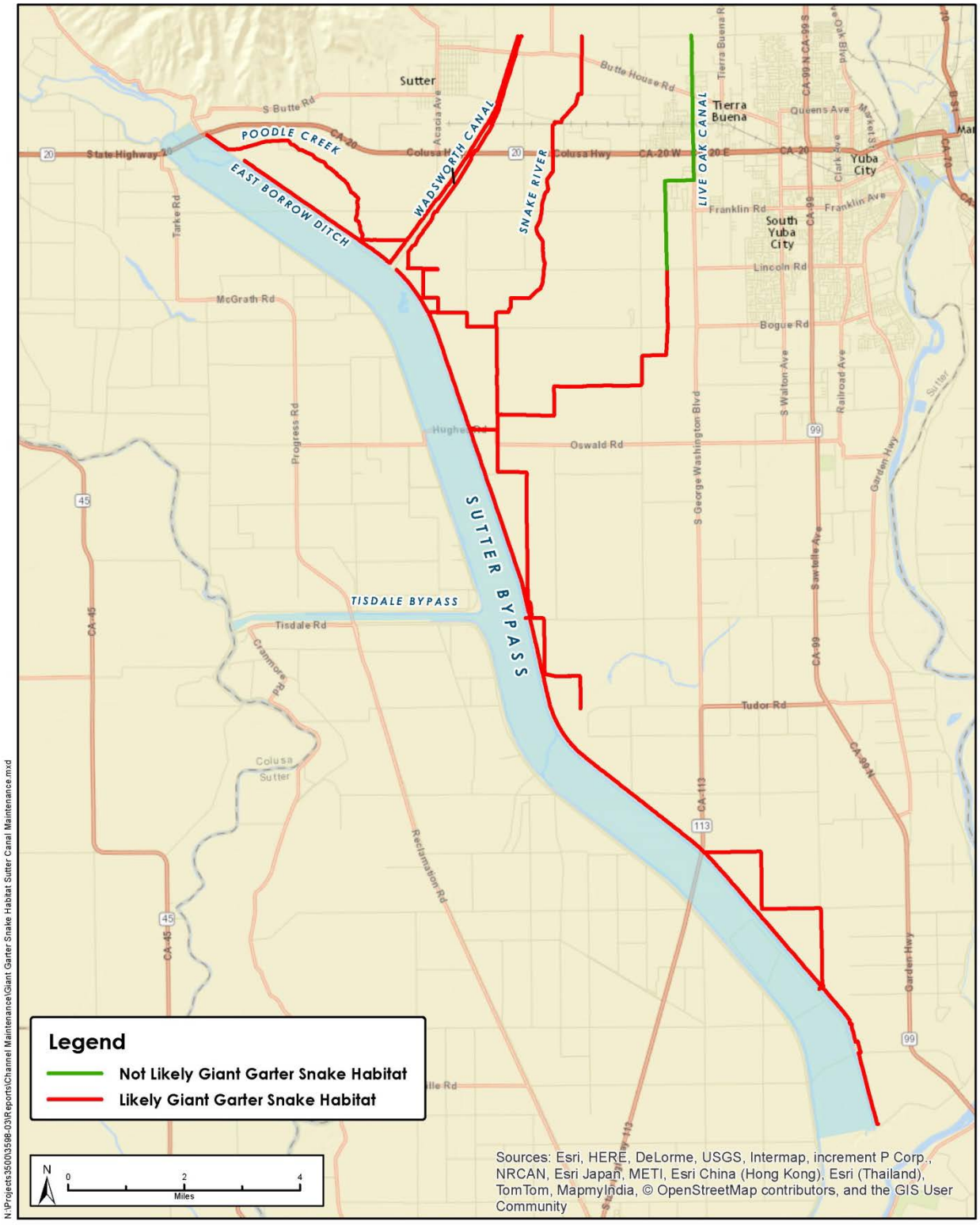


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Figure 2: Giant Garter Snake Habitat Suitability Map

Project No. 6 Collecting Canals (3598-03)

March 2015

Next Steps

ESA, HTH, and Eric Hansen, in coordination with FMO, are developing an avoidance protocol for the likely GGS habitat in the Project area. This avoidance protocol will identify measures that may be taken by the Sutter Maintenance Yard to avoid or reduce adverse effects on GGS during Project activities, based on activity descriptions in the *Project No. 6 Channel Maintenance Draft Project Description* (ESA and HTH 2015).

References

Buck-Diaz, J., S. Batiuk, and J. M. Evens. 2012. Vegetation Alliances and Associations of the Great Valley Ecoregion, California. California Native Plant Society, Vegetation Program, Sacramento, California. [online]: http://www.cnps.org/cnps/vegetation/pdf/great_valley_eco-vegclass2012.pdf.

[CDFW] California Department of Fish and Wildlife. 2014. Wildlife Habitats—California Wildlife Habitat Relationships System. [online]: https://www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp.

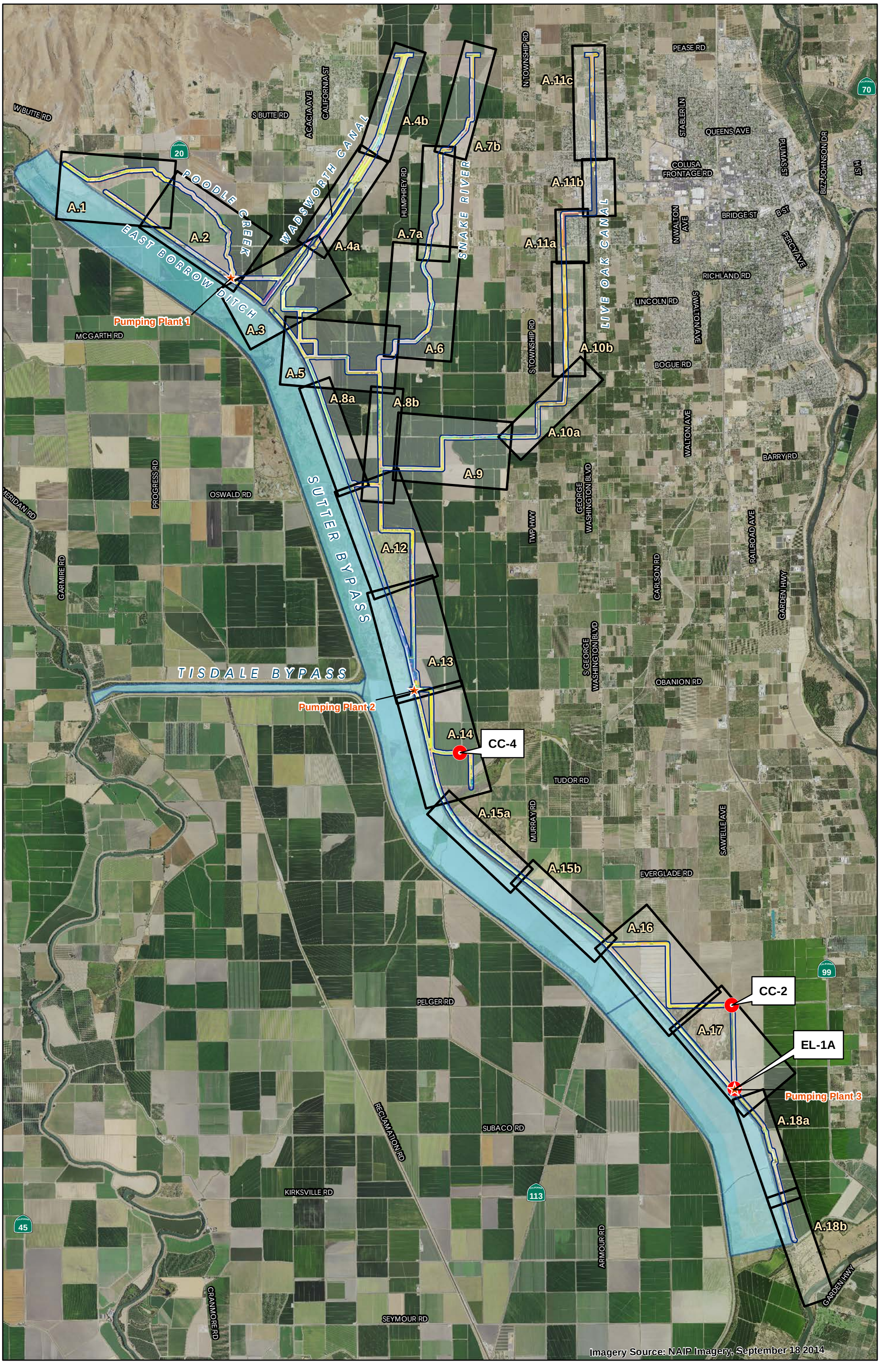
[CNDDB] California Natural Diversity Database. 2014. Results of electronic records search. December. California Department of Fish and Wildlife, Wildlife and Habitat Data Analysis Branch, Sacramento, California. Google, Inc. 2014. Google Earth (Version 7.1.2.2041) [Software].

Hansen, Eric. Environmental Consulting Biologist. December 2014 through January 2015—in-person and email discussions with Ellen Pimentel of H. T. Harvey & Associates, regarding GGS habitat suitability in Project No. 6 Project area.

[USDA] U.S. Department of Agriculture. 2012. National Agriculture Imagery Program. Aerial digital ortho photography taken during the agricultural growing season of 2012.

[USFWS] U.S. Fish and Wildlife Service. 1999. Draft Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*). California/Nevada Operations Office, Region 1, Sacramento, California.

Attachment A – Habitat Maps



N:\Projects3500\3598-03\Reports\Channel Maintenance\Fig A Habitat Map Overview.mxd

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Figure A Habitat Overview Map

Project No.6 Channel Maintenance (3598-03)

February 2015

COLUSA HWY

POODLE CREEK

MOREHEAD RD

SUTTER BYPASS

EAST BORROW DITCH

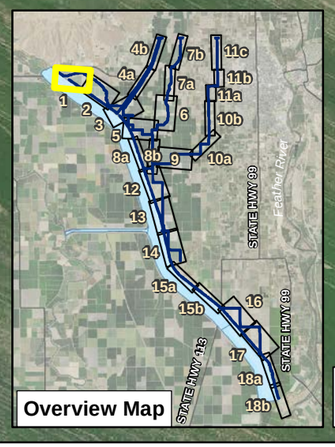
Matchline Figure A.2

Legend

- Project Area

Habitat Types

- Annual Grassland
- Himalayan Blackberry Brambles, Dense (D) = 60 -100%
- Irrigated Row and Field crops
- Native Riparian Forest, Dense (D) = 60 -100%
- Perennial Riverine
- Rice
- Ruderal
- Farm Road
- Toe Road
- Developed



N 0 100 200 300 400 500 600 Feet

Imagery Source: NAIP Imagery, September 18 2014

N:\Projects\3500\3598-03\Reports\Channel Maintenance\Fig A.1 Habitat Map.mxd

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Figure A.1. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

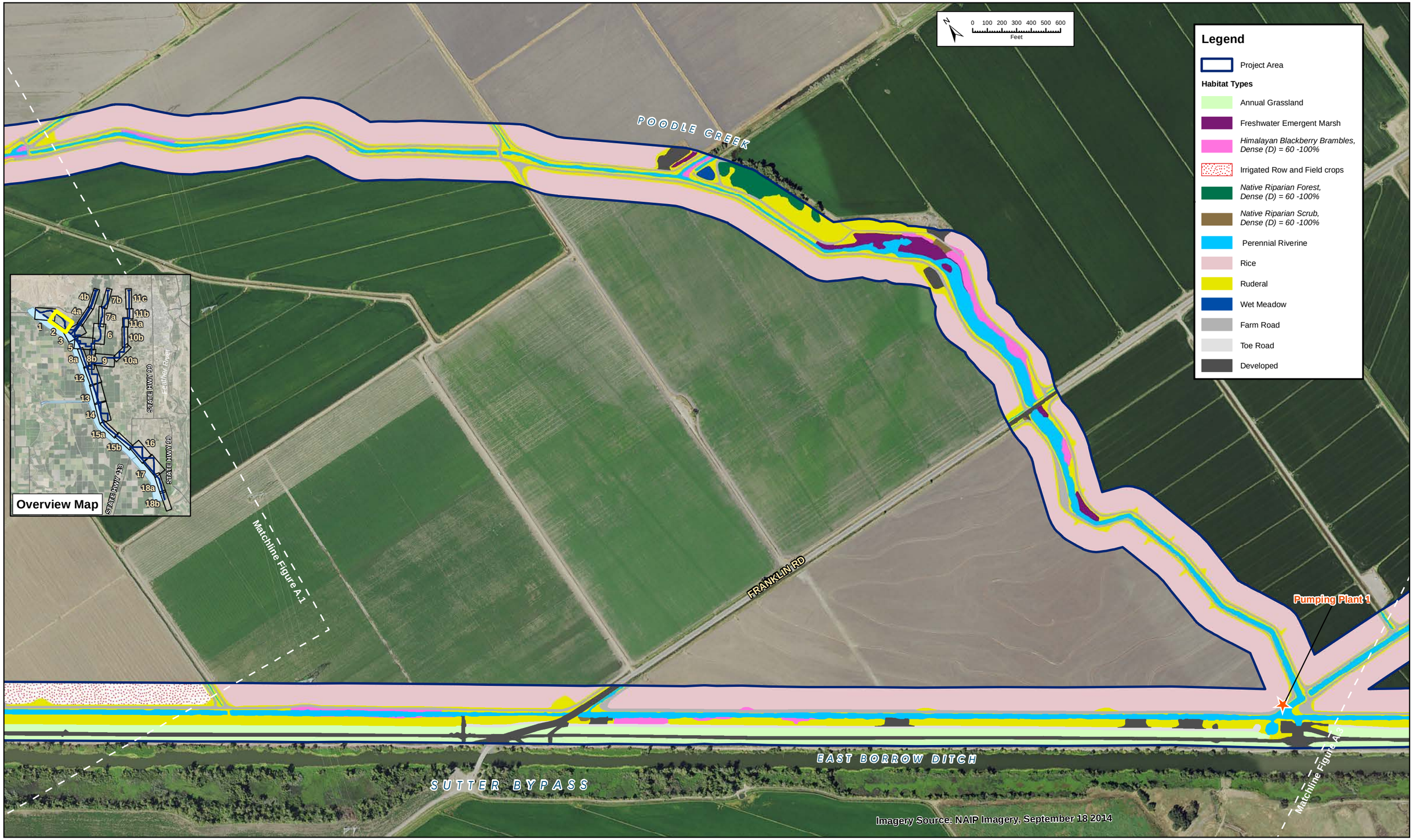

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Figure A.2. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

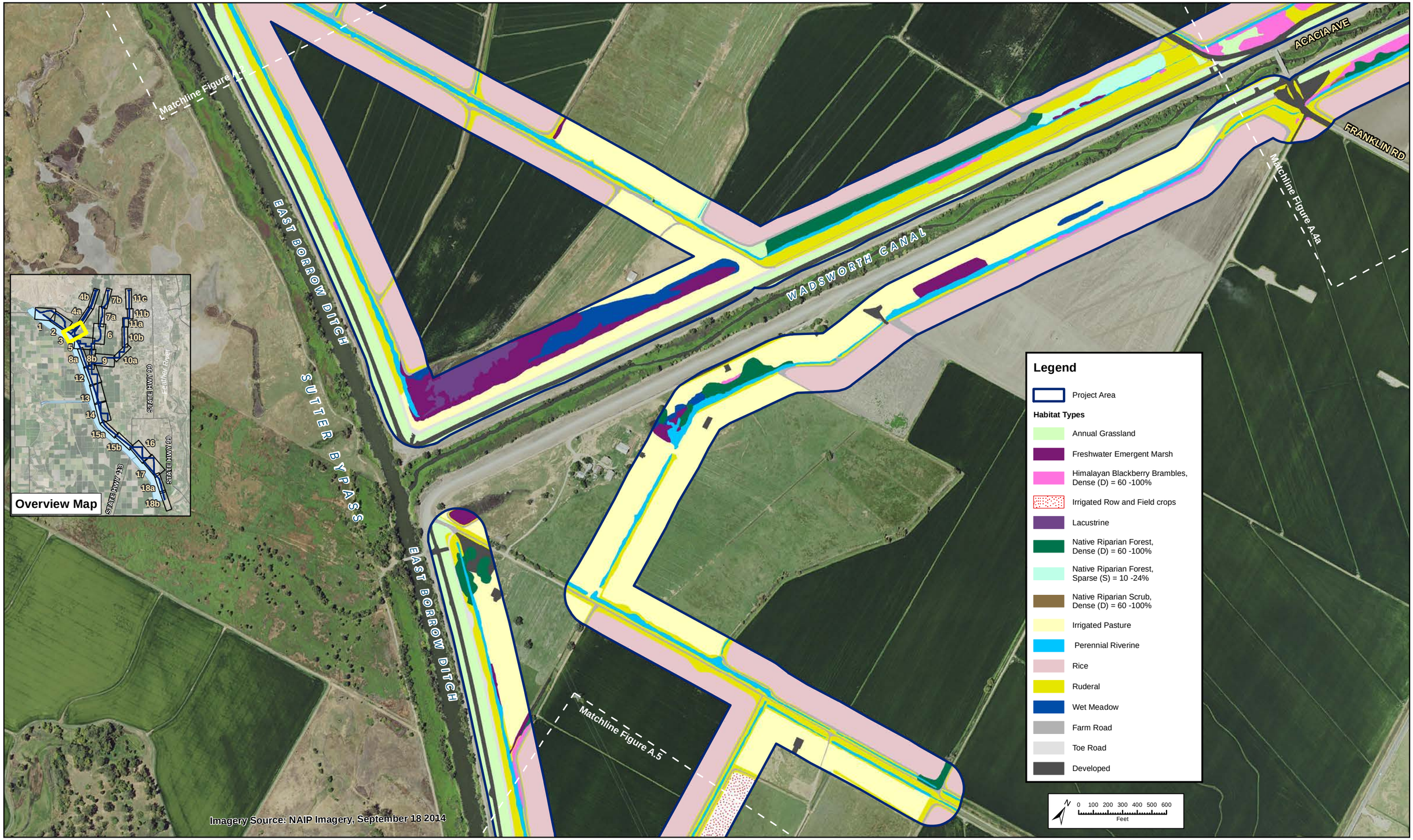

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Figure A.3. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

SHEET A.4a

WADSWORTH CANAL

Matchline Figure A.3

Matchline Figure A.4

Imagery Source: NAIP Imagery, September 18 2014

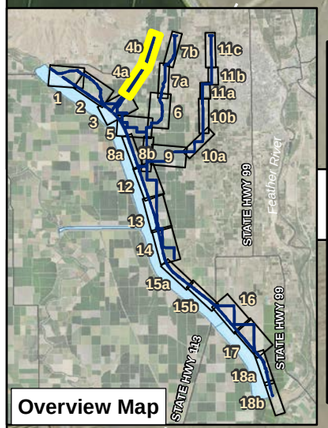
0 100 200 300 400 500 600
Feet

Legend

Project Area

Habitat Types

- Annual Grassland
- Fallow Field
- Freshwater Emergent Marsh
- Himalayan Blackberry Brambles, Dense (D) = 60 -100%
- Irrigated Row and Field crops
- Native Riparian Forest, Dense (D) = 60 -100%
- Native Riparian Forest, Moderate (M) = 40 -59%
- Native Riparian Forest, Open (O) = 24 -39%
- Native Riparian Forest, Sparse (S) = 10 -24%
- Native Riparian Scrub, Dense (D) = 60 -100%
- Nonnative Riparian, Dense (D) = 60 -100%
- Perennial Riverine
- Rice
- Ruderal
- Seasonal Riverine
- Unvegetated Banks
- Wet Meadow
- Farm Road
- Toe Road
- Developed



SHEET A.4b

WADSWORTH CANAL

Matchline Figure A.4

Imagery Source: NAIP Imagery, September 18 2014

N:\Projects\3500\3598-03\Reports\Channel Maintenance\Fig A.4 Habitat Map.mxd

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Figure A.4. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

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Figure A.5. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

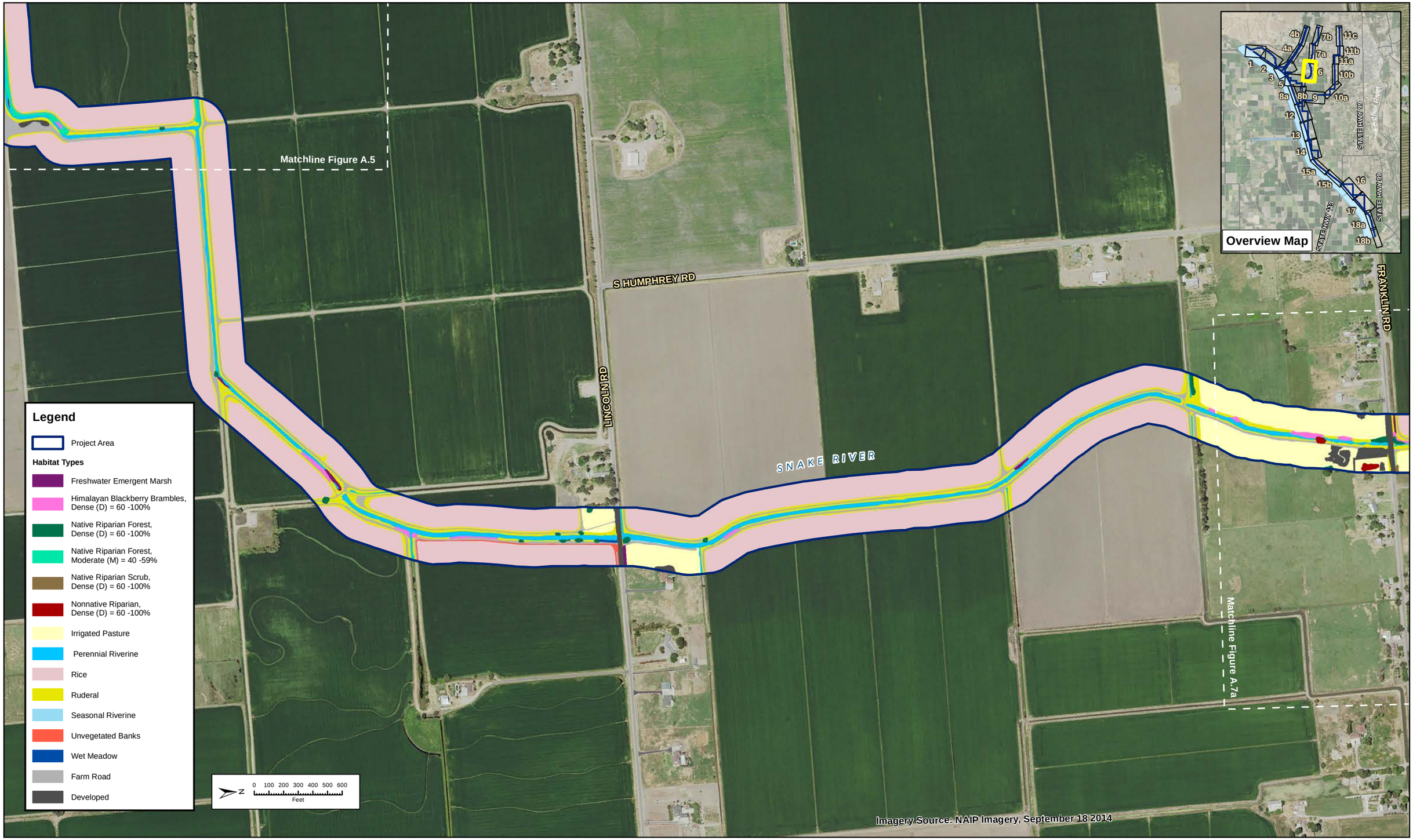

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Figure A.6. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

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SHEET A.7a

Matchline Figure A.6

FRANKLIN RD

COLUSA HWY

SNAKE RIVER

Matchline Figure A.7b

Imagery Source: NAIP Imagery, September 18 2014

0 100 200 300 400 500 600
Feet

N

Legend

Project Area

Habitat Types

- Annual Grassland
- Deciduous Orchard, Dense (D) = 60 -100%
- Deciduous Orchard, Moderate (M) = 40 -59%
- Fallow Field
- Freshwater Emergent Marsh
- Himalayan Blackberry Brambles, Dense (D) = 60 -100%
- Irrigated Row and Field crops
- Lacustrine
- Native Riparian Forest, Dense (D) = 60 -100%
- Native Riparian Forest, Moderate (M) = 40 -59%
- Native Riparian Scrub, Dense (D) = 60 -100%
- Nonnative Riparian, Dense (D) = 60 -100%
- Irrigated Pasture
- Perennial Riverine
- Rice
- Ruderal
- Seasonal Riverine
- Farm Road
- Developed

Overview Map

1 2 3 4a 4b 5 6 7a 7b 8a 8b 9 10a 10b 11a 11b 11c 12 13 14 15a 15b 16 17 18a 18b

Feather River

STATE HWY 99

STATE HWY 113

SHEET A.7b

Matchline Figure A.7a

SBUTTE RD

SNAKE RIVER

BUTTE HOUSE RD

Imagery Source: NAIP Imagery, September 18 2014

N:\Projects\3500\3598-03R eports\Channel Maintenance\Fig A.7 Habitat Map.mxd

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Figure A.7. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

SHEET A.8a

Matchline Figure A.5

Matchline Figure A.8b

EAST BORROW DITCH

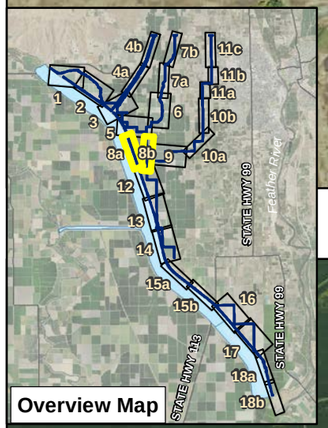
SUTTER BYPASS

HUGHES RD

Matchline Figure A.12

Imagery Source: NAIP Imagery, September 18 2014

0 100 200 300 400 500 600
Feet



Legend

Project Area

Habitat Types

- Annual Grassland
- Freshwater Emergent Marsh
- Himalayan Blackberry Brambles, Dense (D) = 60 -100%
- Native Riparian Forest, Dense (D) = 60 -100%
- Native Riparian Scrub, Moderate (M) = 40 -59%
- Nonnative Riparian, Dense (D) = 60 -100%
- Irrigated Pasture
- Perennial Riverine
- Rice
- Ruderal
- Seasonal Riverine
- Farm Road
- Toe Road
- Developed

SHEET A.8b

Matchline Figure A.9

OSWALD RD

Matchline Figure A.5

SCHLAG RD

Matchline Figure A.12

Matchline Figure A.8a

Imagery Source: NAIP Imagery, September 18 2014

N:\Projects\3500\3598-03\Reports\Channel Maintenance\Fig A.8 Habitat Map.mxd

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Figure A.8. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

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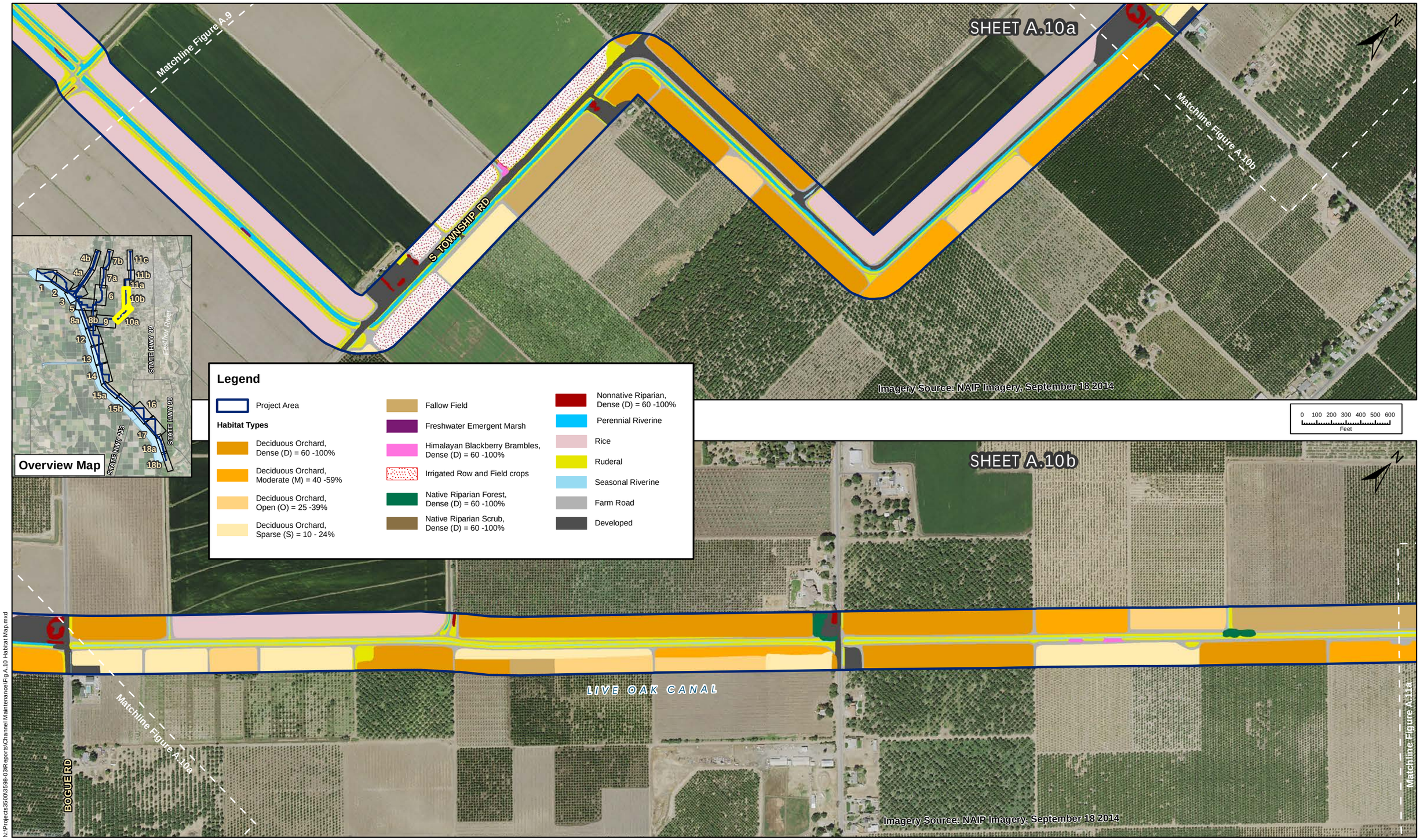
Figure A.9. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015



N:\Projects\3500\3598-03R eports\Channel Maintenance\Fig A.10 Habitat Map.mxd

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Figure A.10. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

SHEET A.11a

SHEET A.11b

SHEET A.11c

LIVE OAK CANAL

FRANKLIN RD

GEORGE WASHINGTON BLVD

COLUSA HWY

BUTTE HOUSE RD

MADISON RD

PEACE RD

Matchline Figure A.11b

Matchline Figure A.11c

Matchline Figure A.11b

Matchline Figure A.10b

Imagery Source: NAIP Imagery, September 18 2014

0 100 200 300 400 500 600
Feet

Legend

Project Area

Habitat Types

- Annual Grassland
- Deciduous Orchard, Dense (D) = 60 -100%
- Deciduous Orchard, Moderate (M) = 40 -59%
- Deciduous Orchard, Open (O) = 25 -39%
- Deciduous Orchard, Sparse (S) = 10 - 24%
- Fallow Field
- Himalayan Blackberry Brambles, Dense (D) = 60 -100%
- Native Riparian Forest, Dense (D) = 60 -100%
- Nonnative Riparian, Dense (D) = 60 -100%
- Irrigated Pasture
- Perennial Riverine
- Ruderal
- Seasonal Riverine
- Unvegetated Banks
- Farm Road
- Toe Road
- Developed

Overview Map

1, 2, 3, 4a, 4b, 5, 6, 7a, 7b, 8a, 8b, 9, 10a, 10b, 11a, 11b, 11c, 12, 13, 14, 15a, 15b, 16, 17, 18a, 18b

STATE HWY 99

STATE HWY 113

Feather River

N:\Projects\3500\3598-03R\reports\Channel Maintenance\Fig A.11 Habitat Map.mxd

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Figure A.11. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

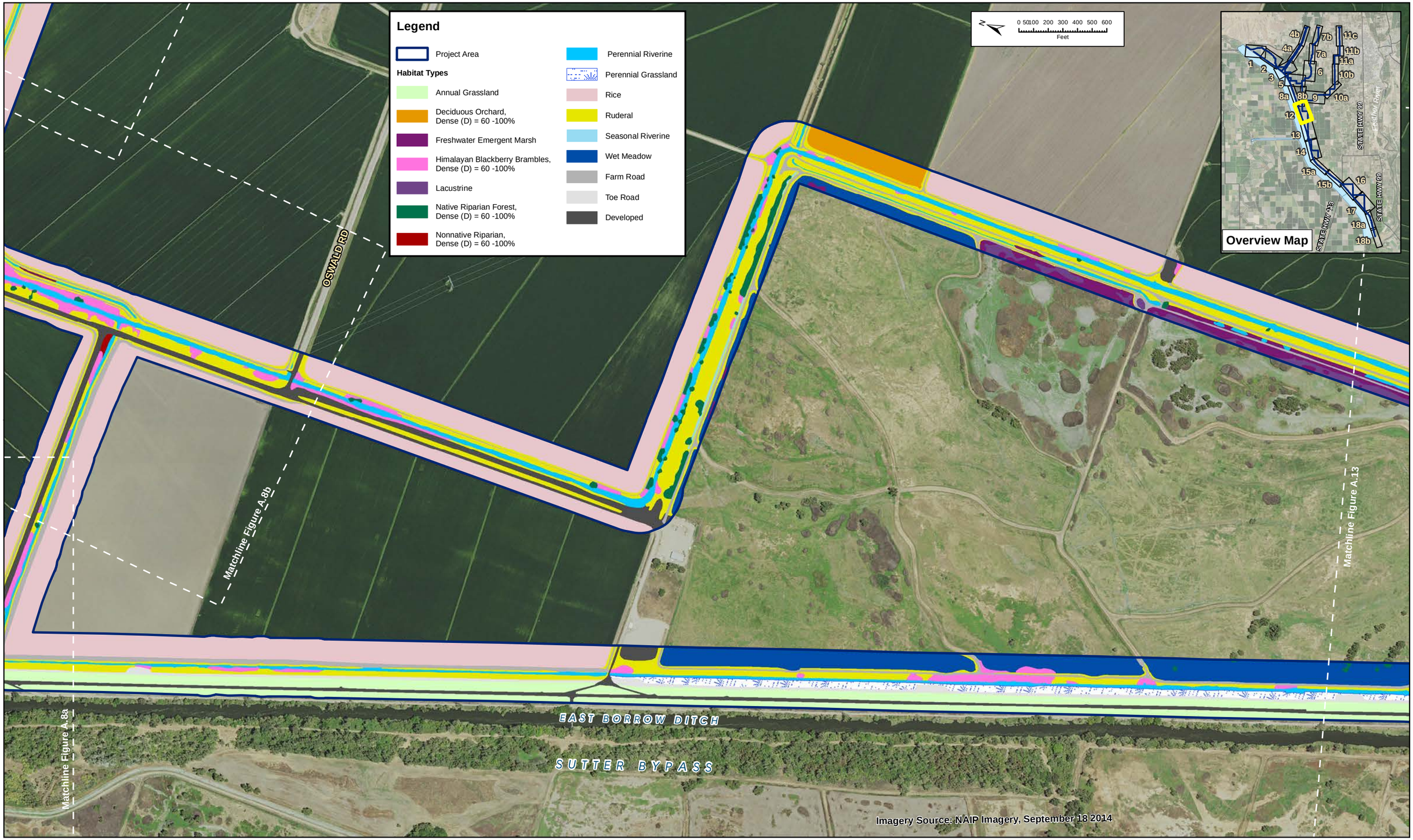

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Figure A.12. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

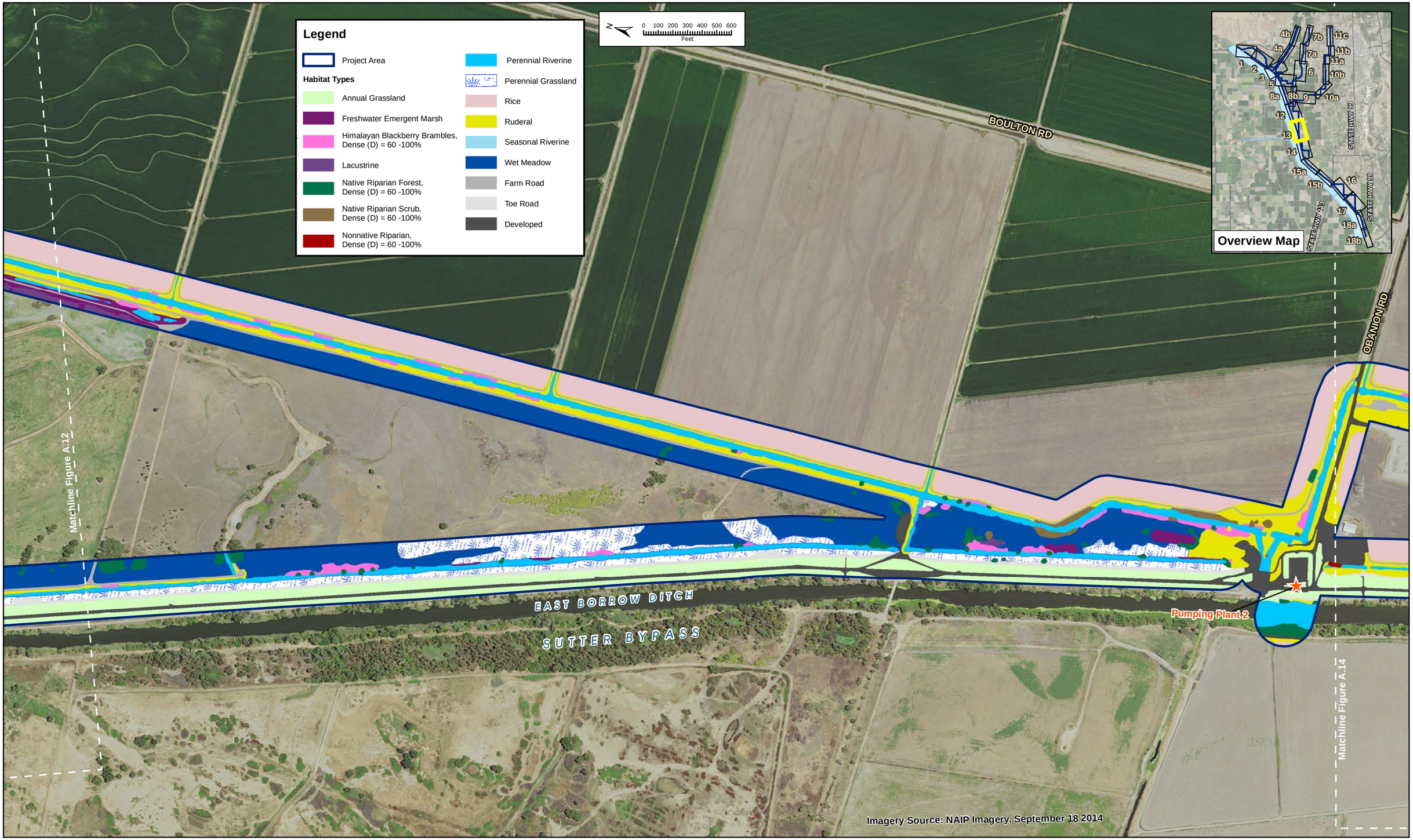

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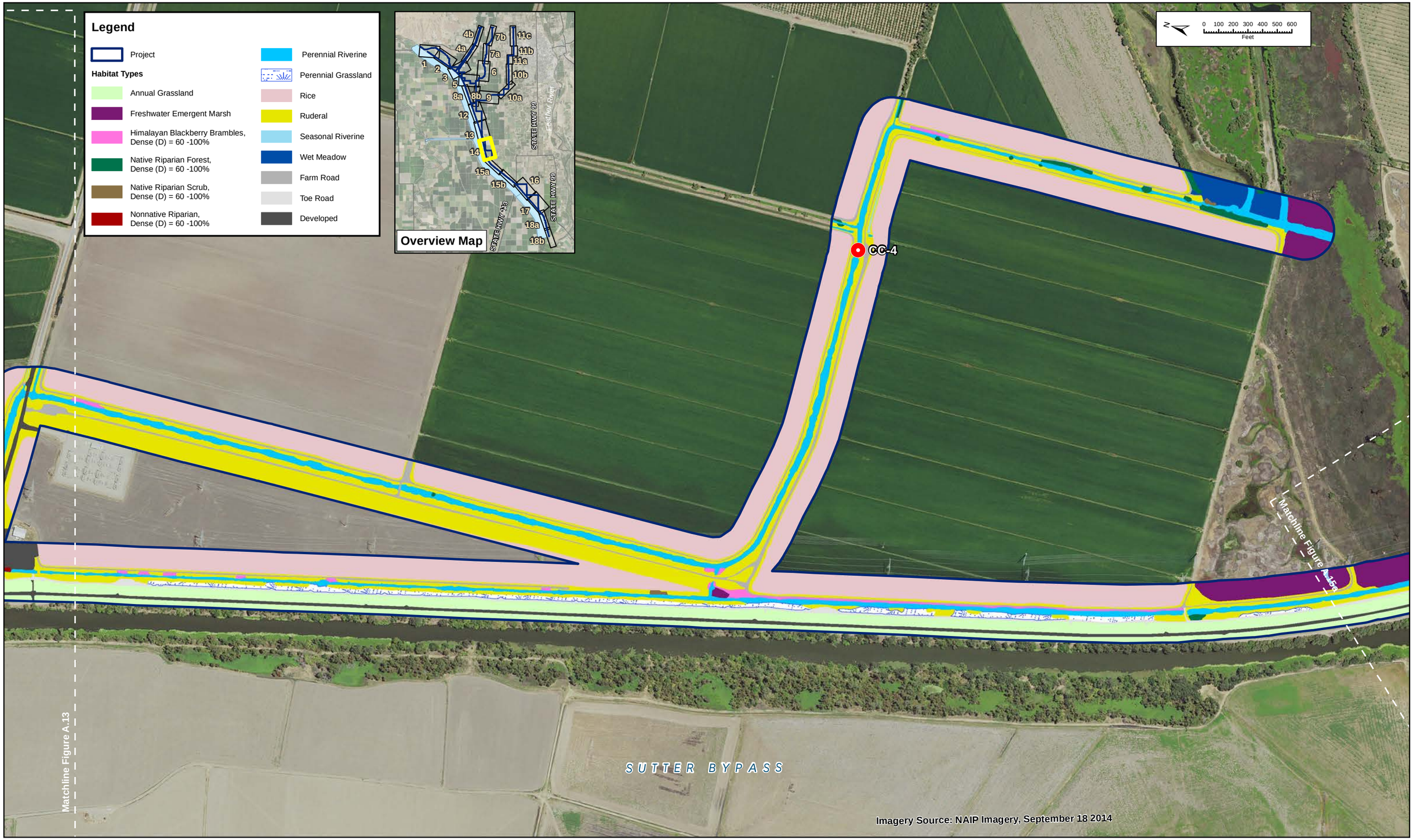
Figure A.13. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015



Division of Flood Management
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Figure A.14. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

SHEET A.15a

Matchline Figure A.14

Matchline Figure A.15b

SUTTER BYPASS

Imagery Source: NAIP Imagery, September 18 2014

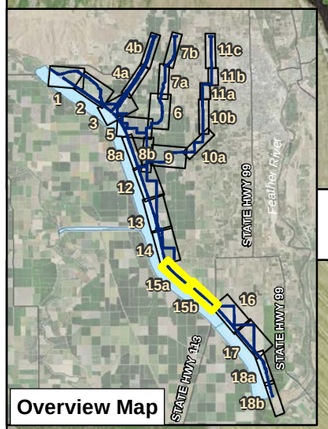
0 100 200 300 400 500 600
Feet

Legend

Project Area

Habitat Types

- Annual Grassland
- Fallow Field
- Freshwater Emergent Marsh
- Himalayan Blackberry Brambles, Dense (D) = 60 -100%
- Irrigated Row and Field crops
- Irrigated Pasture
- Lacustrine
- Native Riparian Forest, Dense (D) = 60 -100%
- Native Riparian Scrub, Dense (D) = 60 -100%
- Perennial Riverine
- Ruderal
- Rice
- Seasonal Riverine
- Wet Meadow
- Farm Road
- Toe Road
- Developed



Overview Map

SHEET A.15b

CA HWY 113

EVERGLADE RD

Matchline Figure A.15a

Matchline Figure A.16

SUTTER BYPASS

Imagery Source: NAIP Imagery, September 18 2014

N:\Projects\3500\3598-03\Reports\Channel Maintenance\Fig A.15 Habitat Map.mxd

Division of Flood Management
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Figure A.15. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

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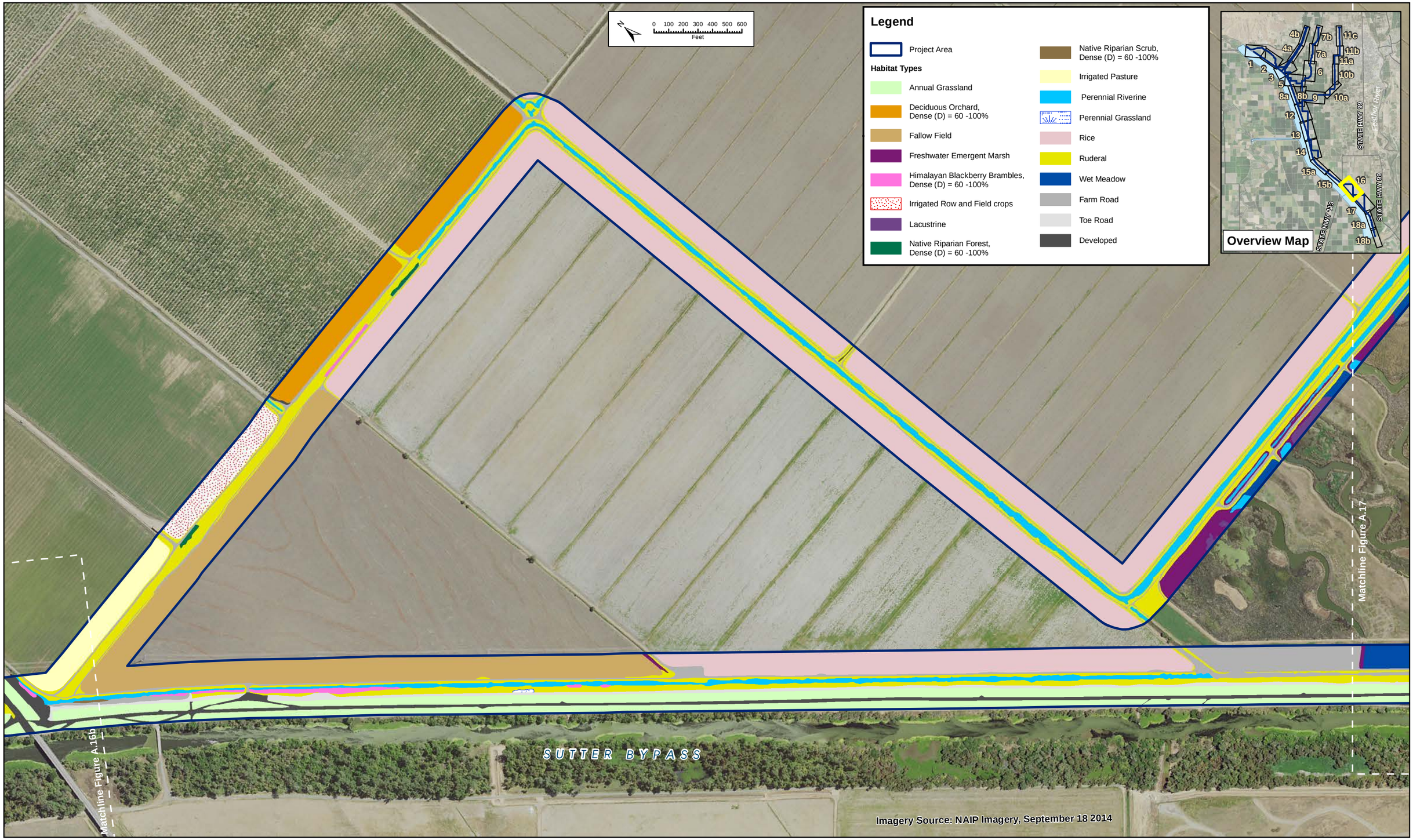

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Figure A.16. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

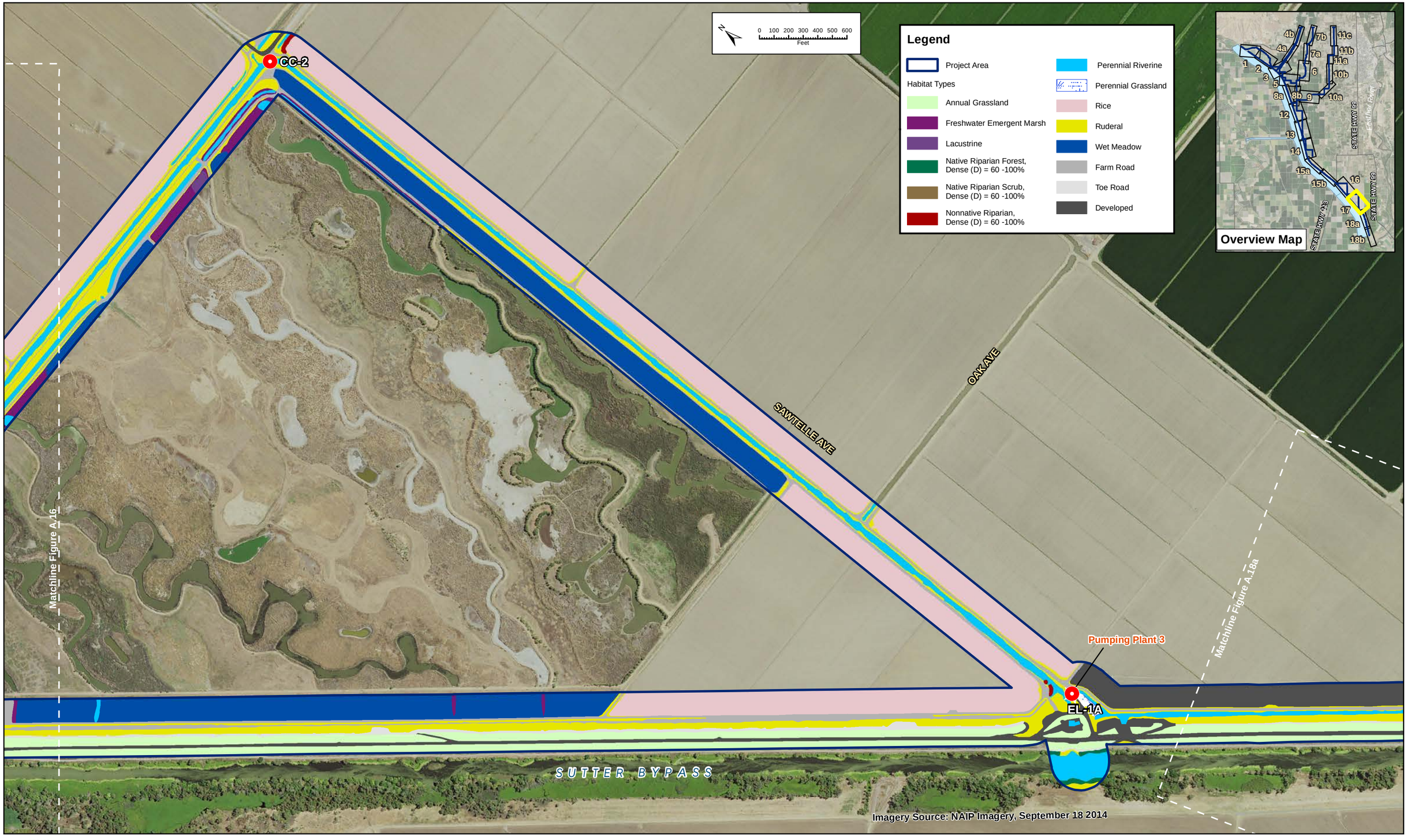

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Figure A.17. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

March 2015

SHEET A.18a

Matchline Figure A.17

SUTTER BYPASS

KIRKSVILLE RD

Matchline Figure A.17b

Imagery Source: NAIP Imagery, September 18 2014

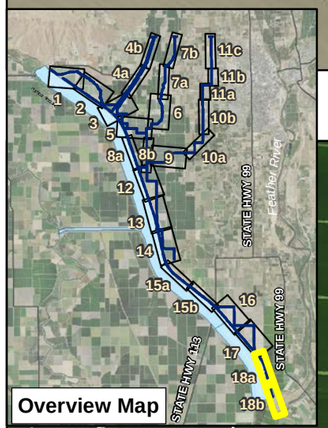
0 100 200 300 400 500 600
Feet

Legend

Project Area

Habitat Types

- Annual Grassland
- Fallow Field
- Freshwater Emergent Marsh
- Himalayan Blackberry Brambles, Dense (D) = 60 -100%
- Native Riparian Forest, Dense (D) = 60 -100%
- Native Riparian Scrub, Dense (D) = 60 -100%
- Irrigated Pasture
- Perennial Riverine
- Perennial Grassland
- Rice
- Ruderal
- Farm Road
- Toe Road
- Developed



Overview Map

SHEET A.18b

Feather River

Matchline Figure A.17a

SUTTER BYPASS

Imagery Source: NAIP Imagery, September 18 2014

N:\Projects\3500\3598-03R eports\Channel Maintenance\Fig A.18 Habitat Map.mxd

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Figure A.18. Habitat Map

Project No. 6 Channel Maintenance (3598-03)

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