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Reference: 022054.400

September 30, 2022

Shane Phillips, P.E., D.PE, D.CEP
Moffat & Nichol
600 University Street, Suite 610
Seattle, Washington 98101

Subject: Preliminary Environmentally Sensitive Habitat Area Results, Redwood Multipurpose Marine Terminal, Samoa, California

Dear Shane Phillips:

Introduction

This preliminary Environmentally Sensitive Habitat Area (ESHA) results memo provides the results of ESHA mapping efforts at the proposed Redwood Multipurpose Marine Terminal (RMMT) site in Samoa, California. The characterization and mapping were completed to inform conceptual planning for the proposed terminal and are intended as baseline information regarding the existing non-wetland ESHA within the study area.

Site Description

The RMMT site is located on the Samoa Peninsula, a narrow peninsula that separates Humboldt Bay from the Pacific Ocean (Figure 1 in Appendix 1). The subject site has a long industrial history of timber production that has resulted in significant grading, infilling, and expansion over previous intertidal and dune lands along the Humboldt Bay shoreline. Most of the study area has been previously developed with paved surfaces, foundations, drainageways and compacted soils remaining following demolitions of structures and industrial facilities.

ESHA with predominantly natural conditions occur throughout the project area supporting a mix of native and non-native species and habitat conditions. Many of the ESHA areas occur within highly manipulated situations on compacted gravels or other formerly developed areas; however, many of these are considered ESHA on account of naturalized conditions or intact habitat present. Additionally, ESHA occurs as remnants of habitat that existed prior to development. These include areas along the periphery of the study area including salt marsh, beach pine forest remnants, and sand dune remnants among others. Lastly, areas with willow or wax myrtle cover growing within asphalt, concrete, or other developed substrate are not considered ESHA. These locations are generally impacted by invasive species cover and present minimal habitat value. Rather than representing sensitive habitat these locations represent a response to abandonment or unmaintained development. As such, these are mapped as “non-ESHA.”

ESHA Mapping Methods

Natural communities within the study area were identified and mapped according to the California Department of Fish and Wildlife (CDFW) "Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities" (CDFW, 2018a). Field work was conducted between April 5 through July 28, 2022, and began with the collection of vegetation data during initial field surveys. The field data was then used to identify natural communities within the study area by keying them out with the online edition of "A Manual of California Vegetation" (CNPS, 2022) and comparing the data to the CNPS alliance descriptions and membership rules. The entire study area was covered during the surveys and vegetation community composition was assessed through vegetation sampling using the CDFW-CNPS "Combined Rapid Assessment (RA) and Relevé" protocol and additional field surveys (CDFW, 2018b). Natural communities were generally identified to alliance and association. Sensitive associations within non-sensitive alliances were identified, when feasible. Rarity of each vegetation type was determined from CDFW's California Natural Community List (CDFW, 2022), the current list of vegetation alliances, associations, and special stands. Alliance and association nomenclature follow "A Manual of California Vegetation" (CNPS, 2022) and CDFW's Natural Communities List (CDFW, 2022). Those natural communities that met the minimum mapping unit (see below) and could be keyed out or met the membership rules in "A Manual of California Vegetation" were mapped.

A Trimble submeter global positioning system (GPS) unit was used to map vegetation assessment points and vegetation community locations. Vegetation community extent was determined on the ground and was then mapped using orthorectified imagery of the site from unoccupied aerial vehicle (UAV) flights, which obtained high-accuracy aerial imagery of the study area in April 2022 immediately preceding the field work. A finescale map was developed from this mapping effort using ArcGIS as shown in Appendix 1, Figures 1-14.

The minimum mapping unit for natural communities was 1 acre for non-sensitive upland communities and approximately 0.10 acre for sensitive natural communities. Some exceptions to these minimum mapping units were made in cases where a smaller mapping unit was necessary to capture a noteworthy patch of sensitive vegetation.

Results

Non-wetland ESHA occurs throughout the study area represented by sensitive vegetation communities, salt marsh, and remnant dunes (see Appendix 1, Figures 2-14). The majority of these features have been manipulated in the past and display differing levels of impact; however, ESHA represents habitat for botanical and wildlife species in an area that is otherwise not suitable on account of developed conditions.

Sensitive vegetation communities within the study area included:

- beach pine forest with 26,798.06 square feet (sq ft; 0.62 acres [ac]) within the study area;
- coastal dune willow-Sitka willow thickets with 230,886.63 sq ft (5.30 ac) within the study area;
- Dune mat with 19,177.55 sq ft (0.44 ac) in the study area;

- Pacific silverweed marsh with 609.12 sq ft (0.01 ac) within the study area;
- Pacific willow groves with 23,898.10 sq ft (0.55 ac) within the study area;
- pickleweed mats with 5,216.85 sq ft (0.12 ac) within the study area;
- sand dune sedge marsh with 772.12 sq ft (0.02 ac) within the study area;
- and wax myrtle scrub with 78,673.75 (1.81 ac) within the study area (see Appendix 1, Figures 2-14 and Table 1 in Appendix 2).

Low elevation salt marsh and mid-high-elevation salt marsh represent vegetation communities dependent on tidal conditions and typically extend from below the Mean Higher High Water (MHHW) to above the MHHW. Wetland indicators may or may not be present and the area is characterized by native salt marsh vegetation that may or may not meet a specific vegetation community criterion. These areas represent critical habitat for many special status species and are an integral component of a healthy intertidal ecosystem. Within the study area, approximately 16,021.03 sq ft (0.37 ac) of low-elevation salt marsh occurs and 54,701.78 sq ft (1.26 ac) of mid-high elevation salt marsh occurs within the study area (see Appendix 1, Figures 2-14 and Table 1 in Appendix 2). Mud flat areas are addressed in another report to be completed for eelgrass and low intertidal areas.

Dune remnant ESHA represents areas of aeolian soil deposits that remain from historic sand dunes that occurred within the study area and that are still intact but may not support the dune mat vegetation community. Most of the historic dunes and dune habitat have been removed for past development of the site. Approximately 5,111.25 sq ft (0.12 ac) of dune remnant ESHA occurs within the project area and represents potential habitat for dune dependent species, although these areas are currently dominated by non-native and invasive species.

Areas with a completely artificial substrate and high invasive species cover were not considered ESHA and more closely reflect a response to past disturbance and abandonment. These areas are unmapped or are shown as non-ESHA or non-native on the map.

Respectfully,

SHN

Joseph Saler
Senior Botanist/Ecologist

JS:ame

Appendix
1. ESHA Maps
2. Table 1 ESHA Features

References

California Department of Fish and Wildlife (CDFW). (March 20, 2018a). Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. Sacramento, CA.

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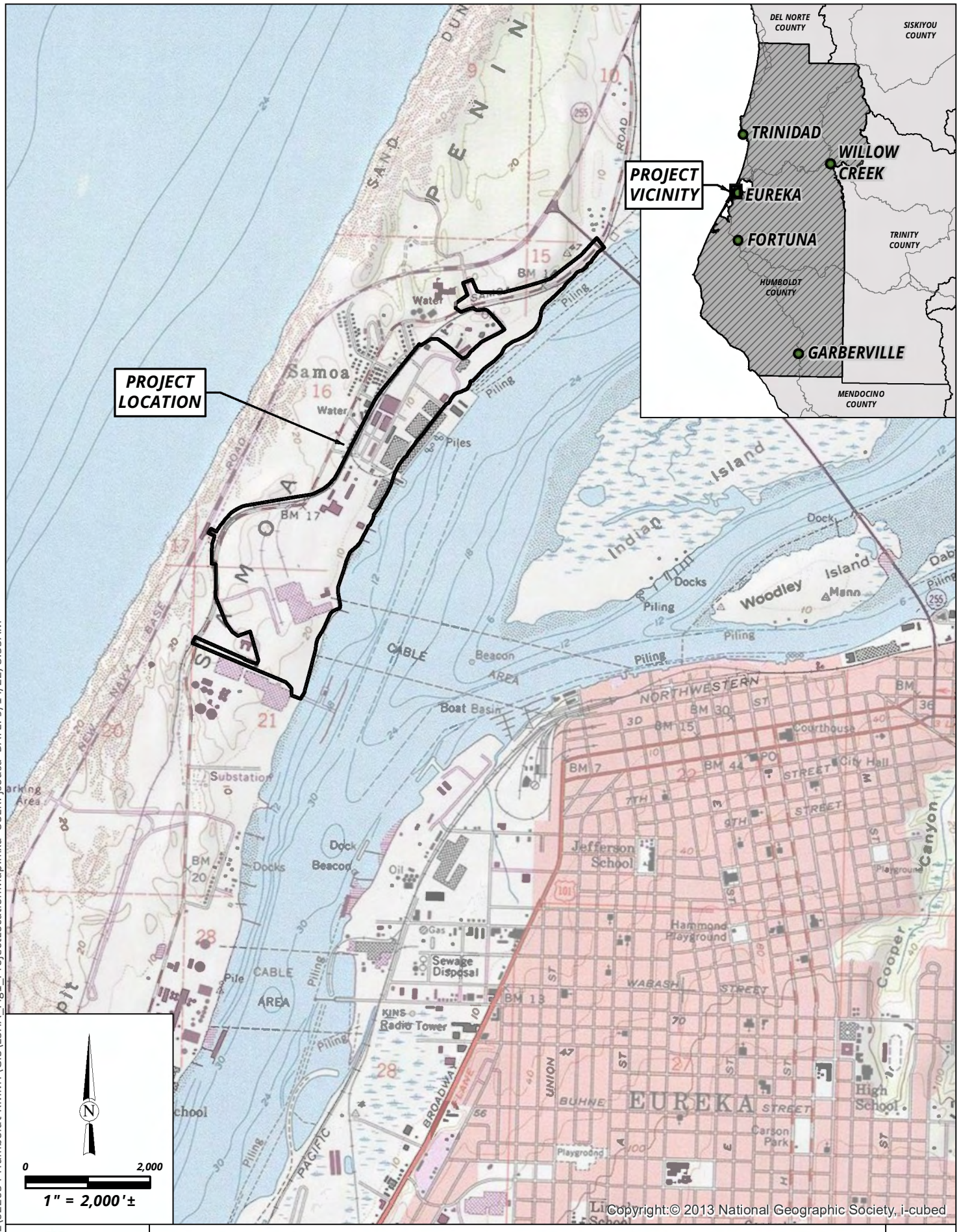
California Native Plant Society. (2022). A Manual of California Vegetation, Online Edition. Accessed from https://vegetation.cnps.org/. California Native Plant Society, Sacramento, CA.

ESHA Maps

1



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Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Project Location Map
Non-wetland ESHA
September 2022 - 022054.400

Figure 1

EXPLANATION

- NON-WETLAND ESHA (PROJECT IMPACT AREA)
- NON-WETLAND ESHA (PROJECT MITIGATION AREA)
- NON-WETLAND ESHA (OUTSIDE IMPACT AREA)
- STUDY AREA
- FIGURE EXTENTS

0 600

1" = 600'±

PHOTO SOURCE:
UAV, SHN, APRIL 2022

12 10 14 8 11 9 7 13 6 5 4 3

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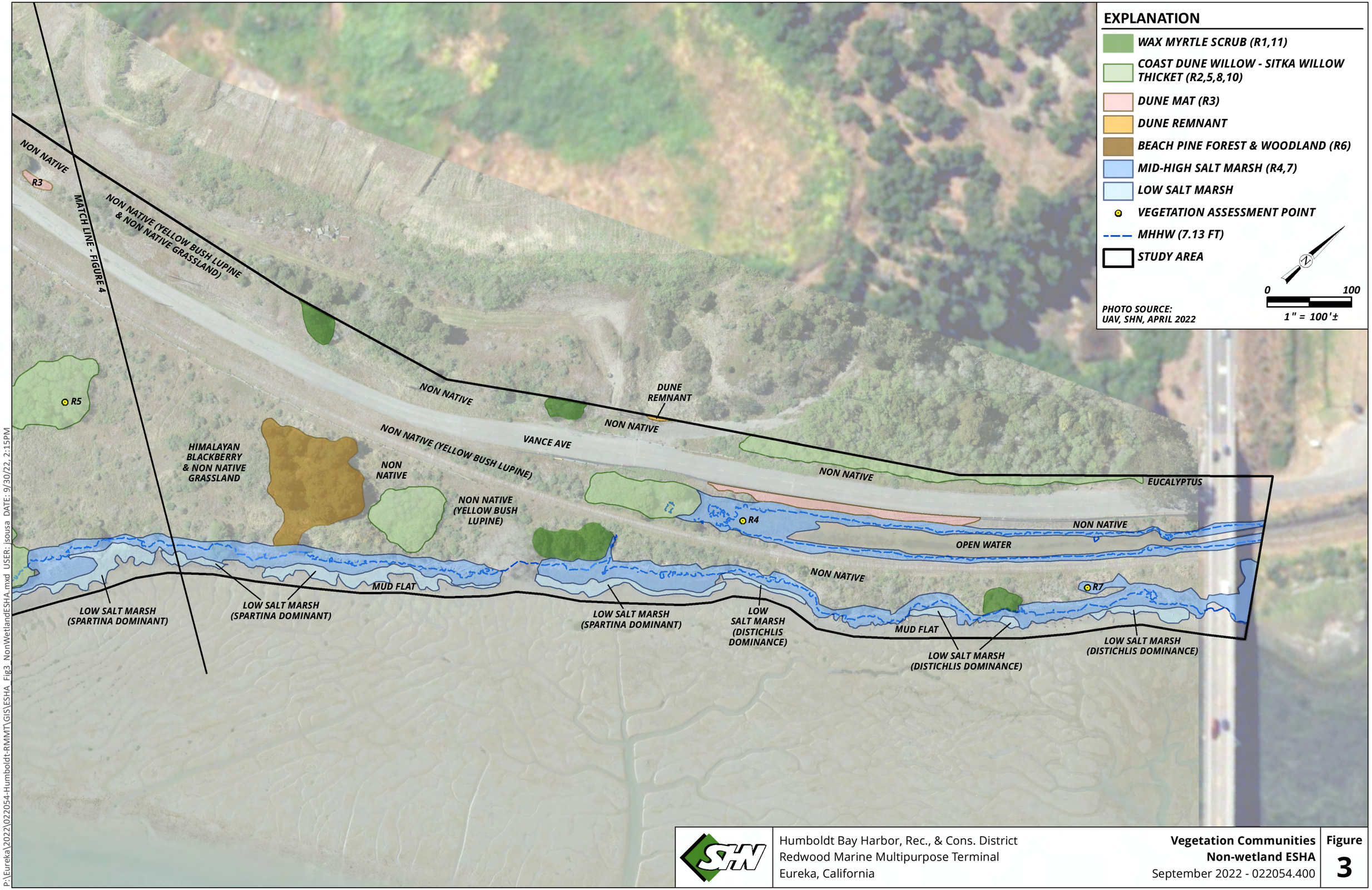
Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Figure Index
Non-wetland ESHA
September 2022 - 022054.400

Figure
2



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Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure
3

EXPLANATION

- WAX MYRTLE SCRUB (R1,11)
- COAST DUNE WILLOW - SITKA WILLOW THICKET (R2,5,8,10)
- DUNE MAT (R3)
- BEACH PINE FOREST AND WOODLAND (R6)
- MID-HIGH SALT MARSH (R4,7)
- LOW SALT MARSH
- VEGETATION ASSESSMENT POINT
- MHHW (7.13 FT)
- STUDY AREA

PHOTO SOURCE:
UAV, SHN, APRIL 2022

0 100
1 " = 100 '±

HIMALAYAN BLACKBERRY
R5
MATCH LINE - FIGURE 3
NON NATIVE
HIMALAYAN BLACKBERRY
LOW SALT MARSH (SPARTINA DOMINANT)
HIMALAYAN BLACKBERRY
HIMALAYAN BLACKBERRY & NON NATIVE
VANCE AVE
NON NATIVE GRASSLAND
NON NATIVE GRASSLAND
NON NATIVE GRASSLAND
RED ALDER FOREST
NON NATIVE GRASSLAND
R3
MOWED NON NATIVE GRASSLAND
R6
R2
HIMALAYAN BLACKBERRY
HIMALAYAN BLACKBERRY
HIMALAYAN BLACKBERRY
MATCH LINE - FIGURE 5
R1
MOWED NON NATIVE GRASSLAND

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Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Wetland Delineation
Wetland Delineation Report
September 2022 - 022054.400

Figure
4

EXPLANATION

- WAX MYRTLE SCRUB (R1,11)
- COAST DUNE WILLOW - SITKA WILLOW THICKET (R2,5,8,10)
- DUNE MAT (R3)
- DUNE REMNANT
- MID-HIGH SALT MARSH (R4,7)
- LOW SALT MARSH
- VEGETATION ASSESSMENT POINT
- MHHW (7.13 FT)
- STUDY AREA

0 100

1" = 100'±

PHOTO SOURCE:
UAV, SHN, APRIL 2022

R1

HIMALAYAN BLACKBERRY

MATCH LINE - FIGURE 4

MOWED NON NATIVE GRASSLAND

NON NATIVE

BLACK ACACIA

PAMPAS GRASS

HIMALAYAN BLACKBERRY

LOW SALT MARSH (SPARTINA & SALICORNIA DOMINANCE)

NON NATIVE RUDERAL

MATCH LINE - FIGURE 6

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Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure 5

MATCH LINE - FIGURE 5

R8

YELLOW BUSH LUPINE
& PAMPAS GRASS

MOWED
NON NATIVE
GRASSLAND

FRENCH
BROOM

MATCH LINE - FIGURE 7

COAST DUNE WILLOW - SITKA WILLOW THICKET (R2,5,8,10)

PICKLEWEED MAT (R12)

MID-HIGH SALT MARSH (R4,7)

LOW SALT

VEGETATION ASSESSMENT

MHHW (7.13 FT)

STUDY

N

0 100

1" = 100'±

PHOTO SOURCE:
UAV, SHN, APRIL 2022

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Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure
6

MATCH LINE - FIGURE 6

R12

HIMALAYAN BLACKBERRY

R10

WILLOW ON SOIL MOUNDS

MATCH LINE - FIGURE 8

EXPLANATION

- WAX MYRTLE SCRUB (R1,11)
- COAST DUNE WILLOW - SITKA WILLOW THICKET (R2,5,8,10)
- PACIFIC SILVERWEED MARSH
- PICKLEWEED MAT (R12)
- MID-HIGH SALT MARSH (R4,7)
- LOW SALT MARSH
- VEGETATION ASSESSMENT POINT
- MHHW (7.13 FT)
- STUDY AREA

N

0 100

1 " = 100 '±

PHOTO SOURCE:
UAV, SHN, APRIL 2022

Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure 7

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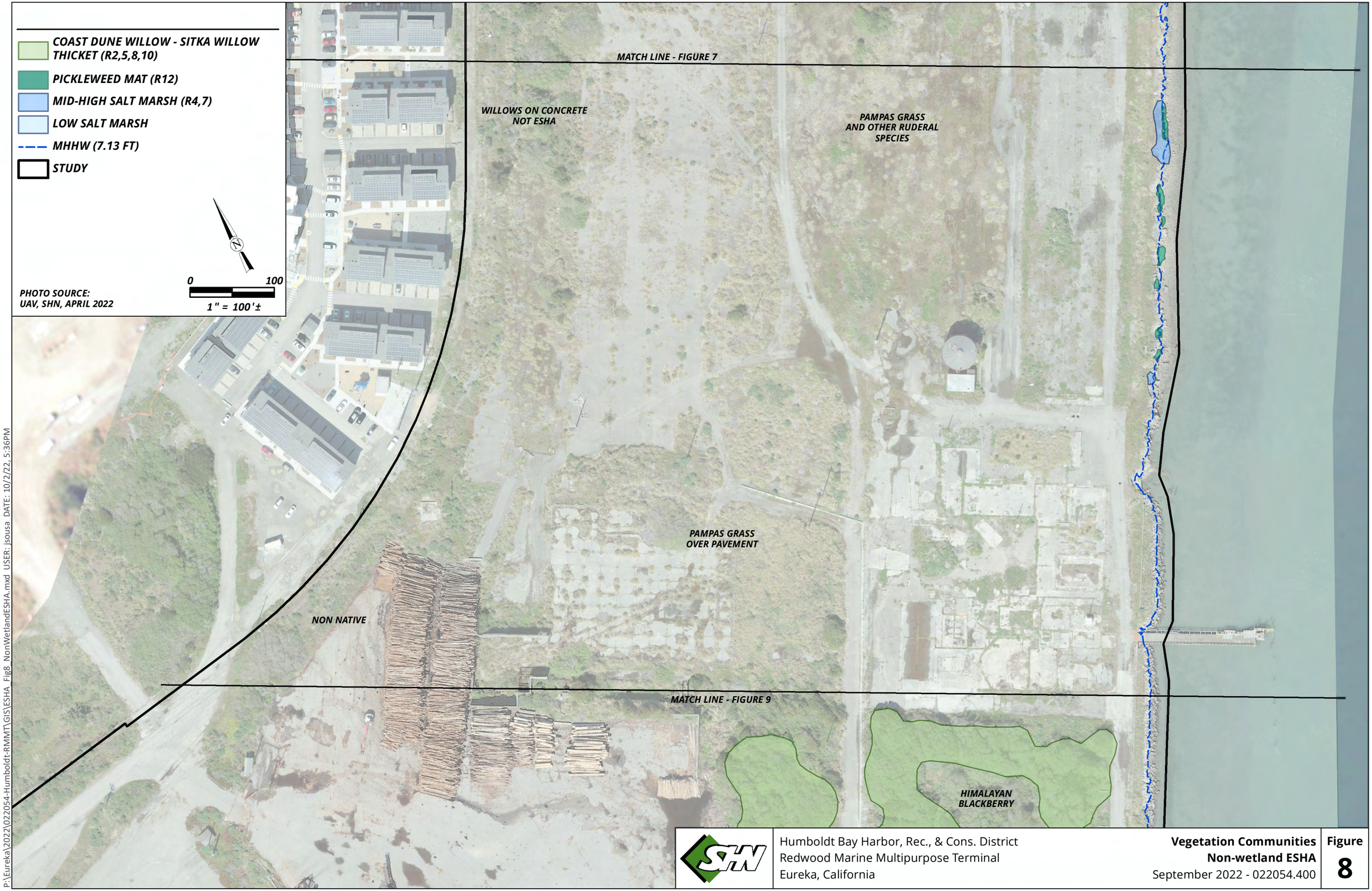

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Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure
8

HIMALAYAN BLACKBERRY

MATCH LINE - FIGURE 8

MATCH LINE - FIGURE 10

NON NATIVE

NON NATIVE RUDERAL SPECIES

MATCH LINE - FIGURE 11

EXPLANATION

- COAST DUNE WILLOW - SITKA WILLOW THICKET (R2,5,8,10)
- PICKLEWEED MAT (R12)
- MID-HIGH SALT MARSH (R4,7)
- LOW SALT MARSH
- MHHW (7.13 FT)
- STUDY AREA

PHOTO SOURCE:
UAV, SHN, APRIL 2022

0 100

1" = 100'±

Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure 9

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EXPLANATION

- WAX MYRTLE SCRUB (R1,11)
- VEGETATION ASSESSMENT POINT
- STUDY AREA

0 100

1" = 100'±

PHOTO SOURCE:
UAV, SHN, APRIL 2022

NON NATIVE &
YELLOW BUSH LUPINE

NON NATIVE GRASSLAND &
YELLOW BUSH LUPINE

R11

NO ACCESS
NOT SURVEYED

MATCH LINE - FIGURE 9

MATCH LINE - FIGURE 12

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Vegetation Communities
Non-wetland ESHA
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Figure
10

MATCH LINE - FIGURE 9

MATCH LINE - FIGURE 12

MATCH LINE - FIGURE 13

PAMPAS GRASS

EXPLANATION

- COAST DUNE WILLOW-SITKA WILLOW THICKET (R2,5,8,10)
- PACIFIC WILLOW GROVE
- PICKLEWEED MAT (R12)
- MID-HIGH SALT MARSH (R4,7)
- LOW SALT MARSH
- MHHW (7.13 FT)
- STUDY AREA

N

0 100

1" = 100'±

PHOTO SOURCE:
UAV, SHN, APRIL 2022

Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure 11

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MATCH LINE - FIGURE 10

NON NATIVE RUDERAL SPECIES

NON NATIVE RUDERAL SPECIES

R9

NO ACCESS
NOT SURVEYED

MATCH LINE - FIGURE 11

MATCH LINE - FIGURE 14

COAST DUNE WILLOW - SITKA WILLOW THICKET (R2,5,8,10)

CAREX

VEGETATION ASSESSMENT POINT

STUDY

0 100

1 " = 100 '±

PHOTO SOURCE:
UAV, SHN, APRIL 2022

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Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure
12

MATCH LINE - FIGURE 11

MATCH LINE - FIGURE 14

PAMPAS GRASS

PAMPAS GRASS & HIMALAYAN BLACKBERRY

EXPLANATION

- PICKLEWEED MAT (R12)
- MHHW (7.13 FT)
- STUDY AREA

N

0 100

1" = 100'±

PHOTO SOURCE:
UAV, SHN, APRIL 2022

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Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure 13

MATCH LINE - FIGURE 12

NO ACCESS
NOT SURVEYED

MATCH LINE - FIGURE 13

EXPLANATION

STUDY AREA

PHOTO SOURCE:
UAV, SHN, APRIL 2022

0 100

1" = 100'±

Humboldt Bay Harbor, Rec., & Cons. District
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Eureka, California

Vegetation Communities
Non-wetland ESHA
September 2022 - 022054.400

Figure 14

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Table 1 ESHA Features

2

Table 1. ESHA Features Within the Study Area

ESHA Type	Feature Area (sqft)
ESHA Impacted by the Project	
Beach Pine Forest and Woodland	22.66 (0.00 ac)
Coastal Dune Willow-Sitka Willow Thickets	113733.39 (2.61 ac)
Dune Mat	4,563.14 (0.10 ac)
Low-elevation Salt Marsh	1,017.01 (0.02 ac)
Mid-High-elevation Salt Marsh	8,219.08 (0.19 ac)
Pacific silverweed marsh	609.12 (0.01 ac)
Pacific Willow Groves	23,898.10 (0.55 ac)
Pickleweed Mat	5,216.85 (0.12 ac)
Sand Dune Remnants	5,006.83 (0.11 ac)
Sand Dune Sedge Marsh	772.12 (0.02 ac)
Wax Myrtle Scrub	24,353.82 (0.56 ac)
Total ESHA Impacted by the Project:	**187,412.11 (4.30 ac)**
ESHA within the Mitigation Area	
Beach Pine Forest and Woodland	11,767.70 (0.27 ac)
Coastal Dune Willow-Sitka Willow Thickets	106,238.57 (2.44 ac)
Dune Mat	0
Low-elevation Salt Marsh	11,608.86 (0.27 ac)
Mid-High-elevation Salt Marsh	15,144.71 (0.35 ac)
Pacific silverweed marsh	0
Pacific Willow Groves	0
Pickleweed Mat	0
Sand Dune Remnants	0
Sand Dune Sedge Marsh	0
Wax Myrtle Scrub	50,989.68 (1.17 ac)
Total ESHA within the Mitigation Area:	**195,749.52 (4.49 ac)**
ESHA not anticipated to be impacted by the Project	
Beach Pine Forest and Woodland	15,007.70 (0.34 ac)
Coastal Dune Willow-Sitka Willow Thickets	10,917.62 (0.25 ac)
Dune Mat	14,614.41 (0.34 ac)
Low-elevation Salt Marsh	3,395.15 (0.08 ac)
Mid-High-elevation Salt Marsh	31,266.90 (0.72 ac)
Pacific silverweed marsh	0
Pacific Willow Groves	0
Pickleweed Mat	0
Sand Dune Remnants	104.42 (0.00 ac)

ESHA Type	Feature Area (sqft)
Sand Dune Sedge Marsh	0
Wax Myrtle Scrub	3,330.31 (0.08 ac)
Total ESHA Not Impacted by the Project	**78,636.52 (1.81 ac)**
Total ESHA within the Study Area (incl. all areas above)	
Beach Pine Forest and Woodland	26,798.06 (0.62 ac)
Coastal Dune Willow-Sitka Willow Thickets	230,886.63 (5.30 ac)
Dune Mat	19,177.55 (0.44 ac)
Low-elevation Salt Marsh	16,021.03 (0.37 ac)
Mid-High-elevation Salt Marsh	54,701.78 (1.26 ac)
Pacific silverweed marsh	609.12 (0.01 ac)
Pacific Willow Groves	23,898.10 (0.55 ac)
Pickleweed Mat	5,216.85 (0.12 ac)
Sand Dune Remnants	5,111.25 (0.12 ac)
Sand Dune Sedge Marsh	772.12 (0.02 ac)
Wax Myrtle Scrub	78,673.75 (1.81 ac)
Total ESHA within the Study Area:	**461,866.23 (10.60 ac)**