

# Eelgrass Survey Report

Samoa Boat Launch Project  
Eureka, California



Prepared for:

City of Eureka

September 2020

019230



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Prepared for:  
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QA/QC:SEC\_\_\_  
Reference: 019230

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# Abbreviations and Acronyms

## Units of Measure

ft <sup>2</sup>	square feet
m	meter
m <sup>2</sup>	square meter

## Additional Terms

APN	Assessor's parcel number
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CDP	coastal development permit
CEMP	California Eelgrass Mitigation Policy and Implementing Guidelines
DBW	Department of Boating and Waterways
GPS	global positioning system
MLLW	mean lower low water
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
QA/QC	quality assurance/quality control
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey



# 1.0 Introduction

SHN has prepared this eelgrass (*Zostera marina* L.) survey report for the City of Eureka Samoa Boat Launch Facility Rehabilitation Project (Figure 1). The purpose of this report is to describe eelgrass mapped within the project area and the eelgrass survey methods for mapping and determining eelgrass density. This report is intended to assist eelgrass-related consultations with the Army Corps of Engineers (USACE), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and California Coastal Commission (CCC).

## 1.1 Project Location

The project is located in the southwestern quarter of the southeastern quarter, Section 10, Township 5 North, Range 1 West, Humboldt Baseline and Meridian, United States Geological Survey (USGS, 2020) Eureka 7.5-minute Quadrangle (Figure 1). The project will occur within two parcels (Assessor's parcel numbers [APNs] 002-241-013 and 002-241-006) with a central project location latitude and longitude of 40.807543° and -124.154695°. The boat launch rehabilitation portion of the project will occur within a small part of the project area within the Eureka slough of Humboldt Bay at the location of the existing boat launch facility. The boat launch rehabilitation will occur within the intertidal zone, subtidal zone, and above the high tide line. The project is located entirely within the Coastal Zone, with boat launch rehabilitation occurring within the State coastal development permit (CDP) jurisdiction.

## 1.2 Project Description

The City of Eureka proposes to demolish and remove the existing toilet building and floating dock and construct the following:

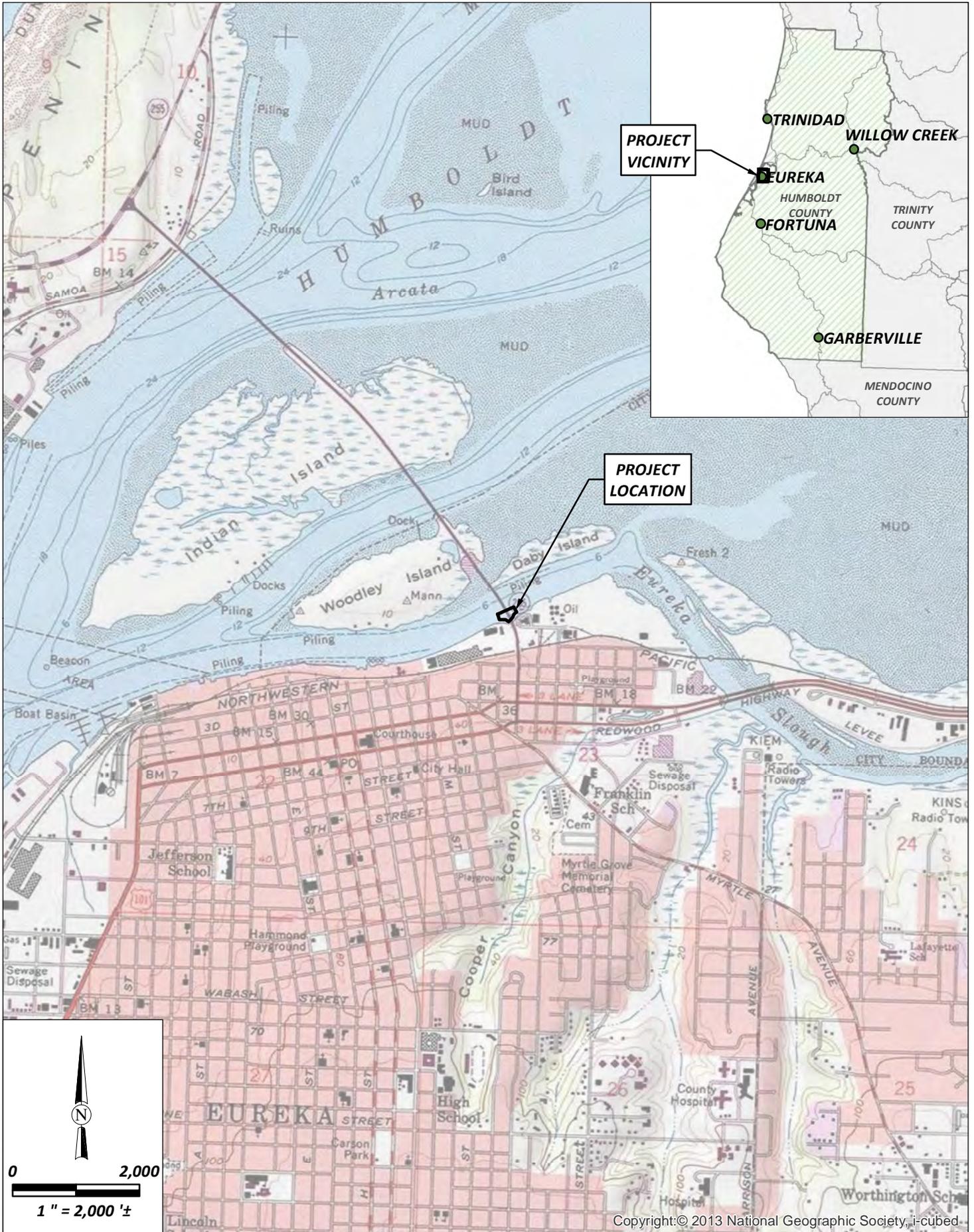
- a new 8-foot by 150-foot fiberglass float on existing piles,
- a new 8-foot by 80-foot low freeboard fiberglass float, including three new 18-inch diameter coated steel piles,
- a new 6,000-square-foot public restroom and commercial facility building,
- new water, sewer, electric, and telephone lines,
- new Department of Boating and Waterways (DBW) sign kiosk and concrete pad, and
- new concrete accessible walkway, new concrete curb, and two new accessible parking stalls.

### 1.2.1 Equipment, Access, and Staging

Construction equipment for the waterside work will consist of two barges and a crane with a vibratory hammer. The new piles are to be installed by a crane with a vibratory hammer working from the larger of the two barges, which will also carry the piles. The smaller of the two barges will serve as a work platform. Construction equipment for the landside work will include a backhoe, reach forklift, dump truck, paving equipment, and roller.

The work site will be accessed from the existing parking lot (Appendix 1, Photo 10), which is accessed from Waterfront Drive. No separate access is proposed from Waterfront Drive. In order to minimize use conflicts with other waterfront activities, construction equipment and materials will be staged in the open area to the west of the parking lot in the upland area at least 100 feet away from the small coastal wetland that was delineated by SHN (SHN, 2020).

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City of Eureka  
 Samoa Boat Ramp Rehabilitation  
 Eureka, California

Project Location Map  
 019230  
 August 2020  
 EEL\_Fig1\_ProjectLoc  
 Figure 1

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## 1.2.2 Timing of Construction

The City of Eureka plans to begin construction as soon as the appropriate permits have been obtained and in accordance with any required seasonal constraints. The City anticipates that upland grading will occur between April 15 and October 15 and that in-water work will occur between July 15 and October 1. Construction will occur over approximately six months to one year during daylight hours (generally between 7:00 am and 7:00 pm Monday through Friday and between 8:00 am and 6:00 pm Saturday and Sunday, although the hours of construction may be increased with prior approval from the City based on an expressed need by the contractor).

## 2.0 Methods

This section summarizes the methods used to determine eelgrass presence or absence within and adjacent to the study area. Eelgrass surveys were conducted by SHN biologists on May 8, 2020 during a -1.9-tide event (National Oceanic and Atmospheric Administration, [NOAA], 2020a, 2020b), during which eelgrass populations could be observed and measured. A tape measure from hardpoints was used to confirm eelgrass locations and extent, in addition to submeter global positioning system (GPS) survey equipment. A 1 meter (m) x 1m quadrat was used to measure turion density and percent vegetated cover.

The eel grass survey was conducted in accordance with the requirements of California Eelgrass Mitigation Policy and Implementing Guidelines (CEMP; NOAA, 2014). The survey effort was conducted during the growing season for eelgrass in northern California (May through September). Eelgrass spatial distribution, areal extent, percent vegetated cover, and shoot density were quantified within the study area and were mapped (Figure 2).

- Eelgrass habitat spatial distribution was delineated by a contiguous boundary around all areas of vegetated eelgrass cover and extending outward a distance of 5 m, excluding areas unsuitable for supporting eelgrass habitat. Individuals greater than 10 m apart were mapped as separate populations.
- Eelgrass areal extent is the cumulative area (square meters) of the spatial distribution boundary polygon of eelgrass habitat. This area was mapped as vegetated cover area and unvegetated habitat.
- Percent vegetated cover was calculated by totaling the area of vegetated eelgrass cover and dividing this by the total eelgrass habitat area. Cover was considered present when one or more turions (leaf shoots) were present per square meter.
- Turion density was calculated as the mean number of eelgrass turions per square meter within mapped eelgrass vegetated cover areas.

A reference site northeast of the project area (Population 2) was investigated for the same parameters as the eelgrass within the study area. Eelgrass habitat spatial extent, aerial extent, percent cover, and turion density fluctuate naturally through time in response to natural environmental variables. It is necessary to correct for natural variability in eelgrass populations when determining impacts from a project. The reference population serves as an unimpacted population of eelgrass that can be used to evaluate project impacts on populations/individuals within close proximity to a project.

**EXPLANATION**

-  **EELGRASS (AERIAL EXTENT)**
-  **POTENTIAL EELGRASS HABITAT**
-  **SAMPLE LOCATIONS**
-  **STUDY AREA**

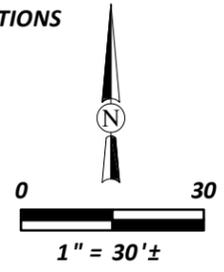


PHOTO SOURCE:  
GOOGLE EARTH, 6/2018



\\Arcata\Projects\2019\019230A-SamoaBoatRamp\GIS\PROJ\_MXD\ USER:jsousa DATE:9/10/2020



City of Eureka  
Samoa Boat Ramp Rehabilitation  
Eureka, California  
August 2020

Eelgrass Populations  
SHN 019230  
Figure 2

## 3.0 Results

Two distinct eelgrass populations were observed within the vicinity of the project area, one immediately west of the project area (Population 1) and the other over 120 feet northeast of the project area (Population 2; Figure 2). The populations, including spatial distribution, extent, percent vegetated cover, and turion density are described below and in Figure 2.

### Population 1

Population 1 exists to the west of the project area and is confined within an elevation band from 0.21 meters to 0.97 m below mean sea level (Figure 2, Appendix 1, Photos 1-6). The population extends southwest of the project area for an undetermined distance; however, the aerial extent is estimated to be 73.7 square meters (m<sup>2</sup>) within the study area. Total suitable eelgrass habitat including unoccupied distances less than 5 m from occupied habitat was 211.5 m<sup>2</sup> within the study area (Figure 2). The area studied for this report represents the northeastern-most extent of this population. Three sample points were taken to characterize the population (Figure 2).

Sampling Point 1 was taken at the eastern-most point of the population, approximately 2.4 meters from the main body of Population 1 (see Figure 2 and Appendix 1, Photos 3 and 4). This Sample Point represented an isolated subset of Population 1 with 12 turions present over an area of 0.5 m<sup>2</sup> for a turion density of 24 turions/m<sup>2</sup>. Vegetative cover was found to be approximately 10 percent within the square meter sampled. Because this small subset of eelgrass was within 10 m of the main body of Population 1, it is considered an extension of the population, and not a separate population.

Sampling Point 2 was taken at the northern most portion of the population, approximately 2 m northwest of Sampling Point 1, and 3 meters northeast of the main body of Population 1 (Figure 2). This Sample Point represented an isolated subset of Population 1 with 6 turions present over an area of 2 m<sup>2</sup> for a turion density of 3 turions/ m<sup>2</sup>. Vegetative cover was found to be approximately 3 percent of the area sampled. This subset of eelgrass was within 5 meters of the main body of Population 1 and is therefore considered an extension of the population, and not a separate population.

Sampling Point 3 was taken within the main body of Population 1, approximately 4 m south west of Sampling Points 1 and 2 (see Figure 2 and Appendix 1, Photo 5). Eelgrass was much denser with greater vegetative cover than the two subset populations sampled at Sampling Points 1 and 2. Turion density was found to be 47 turions/m<sup>2</sup> and vegetative cover was found to be between 40 and 50 percent.

Eelgrass cover and extent is variable, and eelgrass habitat spatial distribution compensates for this variability by calculating all potential eelgrass habitat that could be occupied. This includes a buffer of five meters around the edge of eelgrass populations or individuals within areas that may be suitable habitat. Elevated mud flats were not mapped as potential habitat (Appendix 1, Photos 1 and 8). The total eelgrass habitat spatial extent of Population 1 occurring within the study area including unoccupied spaces less than 5 meters distance was 211.5 square meters, however this population extends southwest for an unknown distance at a very similar turion density and vegetative cover percent. Several individuals were observed to be close to flowering at the time of the survey, suggesting that the survey was conducted during the time of the greatest vegetative cover by eelgrass for the year.

## Population 2

Population 2 exists to the northeast of the project area and is confined within an elevation band from 0.21 meters to 0.97 meters below mean sea level (Figure 2 and Appendix 1, Photos 7-9). The southwestern extent of Population 2 is approximately 120 feet from the project area at its closest point. Density and cover of eelgrass is very similar to what was observed within the main body of Population 1. Turion density was found to be 40 turions/m<sup>2</sup> with an average vegetative cover between 40 and 50 percent. The area studied for this report represents the southeastern extent of this population and the population extends northeast of the project area for an undetermined distance; however, the occupied aerial extent is estimated to be 94 m<sup>2</sup> within the study area. Total suitable eelgrass habitat including unoccupied distances less than 5 meters from occupied habitat was 406.2 m<sup>2</sup> within the study area (see Figure 2 and Appendix 1, Photos 3 and 4). One sample point was taken within Population 2 to characterize the population and can be used as a reference point following completion of construction, as this location is unlikely to be impacted by construction activities and is very similar to Population 1.

## 4.0 Summary and Conclusions

Eelgrass populations occur within the vicinity of the proposed project. It appears that the project as proposed will not directly impact adjacent eelgrass populations and care should be taken to avoid eelgrass populations during construction. Project plans should indicate eelgrass population and habitat locations, and should indicate avoidance of these areas.

Indirect impacts to eelgrass may occur on account of the construction of a new floating dock within 40 feet of Population 1 due to changes in turbidity, shading, sedimentation, or alteration of circulation patterns. This is unlikely given the distance from the proposed floating dock, however pre- and post-construction eelgrass surveys will determine if eelgrass is present within the work area, and if present, whether project-related impacts have occurred. In the unlikely event that project-related eelgrass impacts have occurred, a draft eelgrass mitigation plan will be provided to the appropriate regulatory agencies within 60 days of completion of the post-construction survey.

To ensure the protection of eelgrass within the project vicinity, the City will retain a qualified biologist to conduct a pre-construction eelgrass density and distribution survey in accordance with CEMP (NOAA, 2014) as early as possible during the eelgrass survey season (May through September in northern California), but no more than 60 days prior to construction. The City will provide the appropriate regulatory agencies with a map of eelgrass density and distribution in relation to the proposed work area no more than 30 days after the pre-construction eelgrass survey occurs. If the pre-construction eelgrass survey identifies potential unforeseen impacts to eelgrass, the City will consult with permitting agencies to evaluate the likelihood of project-related impacts and adjust project implementation (if warranted).

The City will perform a post-construction eelgrass survey within 30 days after project completion to determine if eelgrass was impacted. If project completion occurs after the eelgrass active growth season (September 30), the post-construction eelgrass survey would occur the following year during the same month as the pre-construction eelgrass survey. The City will provide the post-construction eelgrass survey results to the appropriate regulatory agencies within 30 days of survey completion.

It is believed that the project will not directly or indirectly impact eelgrass. In the unlikely event that the project does result in adverse indirect effects on eelgrass (based on the pre- and post-construction

eelgrass density and distribution surveys), the City will provide the appropriate regulatory agencies with a draft eelgrass mitigation plan within 60 days of completion of the post-construction survey. The final eelgrass mitigation plan would be developed in coordination with the USACE, NMFS, CCC, and CDFW.

## 5.0 References

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Photos

1



**Photo 1: Looking west across the existing boat launch toward the eastern edge of Population 1. Note how elevations become unsuitable for eelgrass adjacent to the boat launch. Photo taken May 8, 2020.**



**Photo 2: Looking southwest toward the eastern edge of Population 1. Note steep mud flats that restrict eelgrass to a narrow band. Photo taken May 8, 2020.**



**Photo 3: Looking north across the eastern edge of Population 1. Note the 1x1 meter quadrat that is placed over the eastern most eelgrass within Population 1 representing Sampling Point 1. Photo taken May 8, 2020.**



**Photo 4: Sampling Point 1 showing 12 turions and an estimated 10% vegetative cover. Photo taken May 8, 2020.**



**Photo 5: Main body of Population 1 looking west represented by Sampling Point 3. Within the occupied habitat turion density averaged 47 turions/m<sup>2</sup> and vegetated cover was between 40 and 50%. Photo taken May 8, 2020.**



**Photo 6: Population 1 looking west. Photo taken May 8, 2020.**



**Photo 7: Eelgrass Population 2 approximately 120 feet east of the project at its nearest point. Note mud flat and narrow elevation band of occurrence. Photo taken May 8, 2020.**



**Photo 8: Mud flat and conditions east of the project looking north. Note bridge infrastructure. Photo taken May 8, 2020.**



**Photo 9: Looking north toward eelgrass Population 2 from the existing dock. Elevations and shading from the bridge likely prevent growth of eelgrass closer to the dock. Photo taken May 8, 2020.**



**Photo 10: Boat launch parking lot looking north toward the existing dock facilities. Photo taken May 8, 2020.**

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