FINAL INITIAL STUDY/
Negative Declaration

Prepared Pursuant to the
California Environmental Quality Act

PROJECT: Mad River Slough Shellfish Nursery
(State Clearinghouse Number: 2023060574)

LEAD AGENCY: Humboldt Bay Harbor, Recreation, and Conservation District

August 22, 2023

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Section 1.0 Introduction

A draft Initial Study for the proposed project was circulated for public comment from June 20, 2023 to July 20, 2023. One comment letter was received. The letter was from the CA Department of Fish and Wildlife (CDFW) and is included as Attachment C. The letter made recommendations to modify the water intake screen design to better protect larval longfin smelt from entrainment and impingement. Based on the comment, the screen design was modified and now reflects CDFW's recommendation. The revised screen design is included as Attachment B and CDFW correspondence regarding the revised screen design is included as Attachment D. Associated changes to the text of the draft Initial Study are shown below in underline/strikethrough format.

1.1 Purpose of this Document

This California Environmental Quality Act (CEQA) Initial Study (IS) assesses the environmental effects of restarting an existing shellfish nursery in Mad River Slough, California. The name of the project is the Mad River Slough Shellfish Nursery (also referred to as the "Project"). This IS was prepared pursuant to the requirements of CEQA and in compliance with the State CEQA Guidelines (Title 14, California Administrative Code, Section 1400 et seq.).

The Humboldt Bay Harbor, Recreation, and Conservation District (District) is the state lead agency under CEQA. The District must evaluate the environmental impacts of the Project when considering whether to approve the Project. The IS serves as an informational document to be used in planning and decision-making, and does not recommend approval or denial of the Project.

1.2 Scope of this Document

This document evaluates the Project's potential impacts related to the following topics:

- aesthetics
- agricultural and forestry resources
- air quality
- biological resources
- cultural resources
- energy
- geology and soils
- greenhouse gas emissions
- hazards and hazardous materials
- hydrology and water quality
- land use and planning
- mineral resources
- noise
- population and housing
- public services
- recreation
- transportation
- tribal cultural resources
- utilities and service systems
- wildfire
- mandatory findings of significance

1.3 Impact Terminology

The following general terms are used in this IS to describe the significance of impacts that could result from the Project:

- The Project is considered to have *no impact* if the analysis concludes that the Project could not affect a particular resource topic.
- An impact is considered *less than significant* if the analysis concludes that the Project would cause no substantial adverse change to the environment and that impacts would not require mitigation.
- An impact is considered *less than significant with mitigation* if the analysis concludes that the Project would cause no substantial adverse change to the environment with the inclusion of mitigation measures identified by the lead agency.
- An impact is considered *significant* if the analysis concludes that the Project would cause substantial adverse change to the environment that could not be reduced to less-than significant levels by the inclusion of identified mitigation measures.

1.4 General Information

1. **PROJECT TITLE:** Mad River Slough Shellfish Nursery

2. **LEAD AGENCY/CONTACT NAME AND ADDRESS:** Humboldt Bay Harbor, Recreation and Conservation District, P.O. Box 1030, Eureka, CA 95502-1030. ~~Doug Saucedo, Natural Resources Coordinator~~, (707) 443-0801, ~~dsaucedo@humboldtbay.org~~ District Planner, districtplanner@humboldtbay.org

3. **PROJECT LOCATION:** Tidelands in Arcata Bay, California (parcel 506-291-013)

4. **PROJECT SPONSOR'S NAME AND ADDRESS:** Kimberly and William Rich, PO Box 184, Bayside, CA 95524. (707) 834-7777, krich1072@gmail.com

5. **GENERAL PLAN DESIGNATION:** Agriculture Exclusive / Natural Resources

6. **ZONING:** Agricultural Exclusive**,** Natural Resources/Water

7. **SURROUNDING LAND USES AND SETTING:** refer to Section 2.0 below

8. **DESCRIPTION OF THE PROJECT:** refer to Section 3.0 below

9. PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED:

Level	Agency	Type of Approval, Permit or Consultation
Local	Humboldt Bay Harbor, Recreation & Conservation District	Harbor District Permit
State	California Coastal Commission	Coastal Development Permit
State	North Coast Regional Water Quality Control Board	Clean Water Act Section 401 Water Quality Certification
Federal	United States Army Corps of Engineers	Clean Water Act Section 404 and Rivers and Harbors Act Section 10 Permit

10. HAVE CALIFORNIA NATIVE AMERICAN TRIBES TRADITIONALLY AND CULTURALLY AFFILIATED WITH THE PROJECT AREA REQUESTED CONSULTATION PURSUANT TO PUBLIC RESOURCES CODE SECTION 2108.3.1? IF SO, HAS CONSULTATION BEGUN?

An email was sent to the California Native American Heritage Commission (NAHC) on October 24, 2022 requesting information on the potential for sacred lands at the Project site and the appropriate Native American Tribes to contact regarding the Project.

Based on the NAHC response, the following Tribes were contacted on October 17, 2022 to determine if they have concerns regarding the Project and/or would like to be consulted consistent with State Assembly Bill 52.

- Wiyot Tribe
- Bear River Band of the Rohnerville Rancheria
- Blue Lake Rancheria
- Cher-Ae Heights Indian Community of the Trinidad Rancheria
- Big Lagoon Rancheria
- Hoopa Valley Tribe
- Karuk Tribe
- Yurok Tribe
- Round Valley Reservation/Covelo Indian Community

The Wiyot Tribe and Blue Lake Rancheria responded that they do not have concerns regarding the Project as long as ground disturbance will not occur, which it will not. On December 6, 2022, co-project owner William Rich spoke with the Bear River Band of the Rohnerville Rancheria Tribal Historic Preservation Officer Melanie McCavour in-person. It was discussed that the project will not require any ground disturbing activity and that all infrastructure is in place or will be installed over the ground surface. Mrs. McCavour indicated that the Mad River Slough vicinity is culturally important but expressed no specific concerns with the proposed project. Mr. Rich provided an open invitation to visit the location. On November 3, 2022 William Rich also spoke with Daniel Holsapple of the Blue Lake Rancheria and indicated that no ground disturbing activities would be needed to restart the existing facility. Mr. Holsapple is familiar with the location and expressed no further concerns.

The NAHC also recommended contacting the Blue Lake Rancheria regarding the potential for sacred lands at the site. The Blue Lake Rancheria was contacted and responded that they believe that NAHC identification of potential sacred lands is in relation to a cultural resource over two-miles from the Project site that would not be impacted by the Project.

No other Tribe responded as of June 16, 2023.

Section 2.0 Surrounding Land Uses and Setting

Humboldt Bay is a complex ecosystem and valuable resource for California and the nation because of its natural resources, aesthetic appeal and recreational opportunities, ecological services, economic benefits, and vital transportation links. Visitors and Humboldt County residents value Humboldt Bay for its natural and anthropogenic attributes. The biota that use the bay are diverse and ecologically important locally and globally. The habitat in the bay provides resources for strong commercial fisheries, including crabs, bivalves, and finfish, and habitat for shorebird and waterfowl migrants. The Humboldt Bay area hosts more than 400 plant species, 300 invertebrate species, 100 fish species, and 260 bird species, including those that rely on the bay as they travel the Pacific Flyway. According to the 2020 U.S. Census, the largest nearby urban concentrations are in Arcata to the north (population approximately 18,857) and Eureka to the south (population approximately 26,512) (U.S. Census Bureau. 2020). Smaller towns along the Samoa peninsula, from north to south, include Manila, Samoa, and Fairhaven.

Humboldt Bay encompasses roughly 17,759 acres at mean high water (MHW). The Project is located in Mad River Slough (Figures 1 and 2). Mad River Slough is a tidal slough of Humboldt Bay without any major freshwater inputs (e.g., rivers). The Project site is in a predominantly agricultural area with low density residences. A portion of the Humboldt Bay National Wildlife Refuge is west of the Project site. There are existing shellfish nursery rafts within Mad River Slough approximately 2 miles south of the Project. There are other nursery operations in the Samoa Channel, closer to the bay's entrance and oyster's are cultured to market size within intertidal areas of north Humboldt Bay.

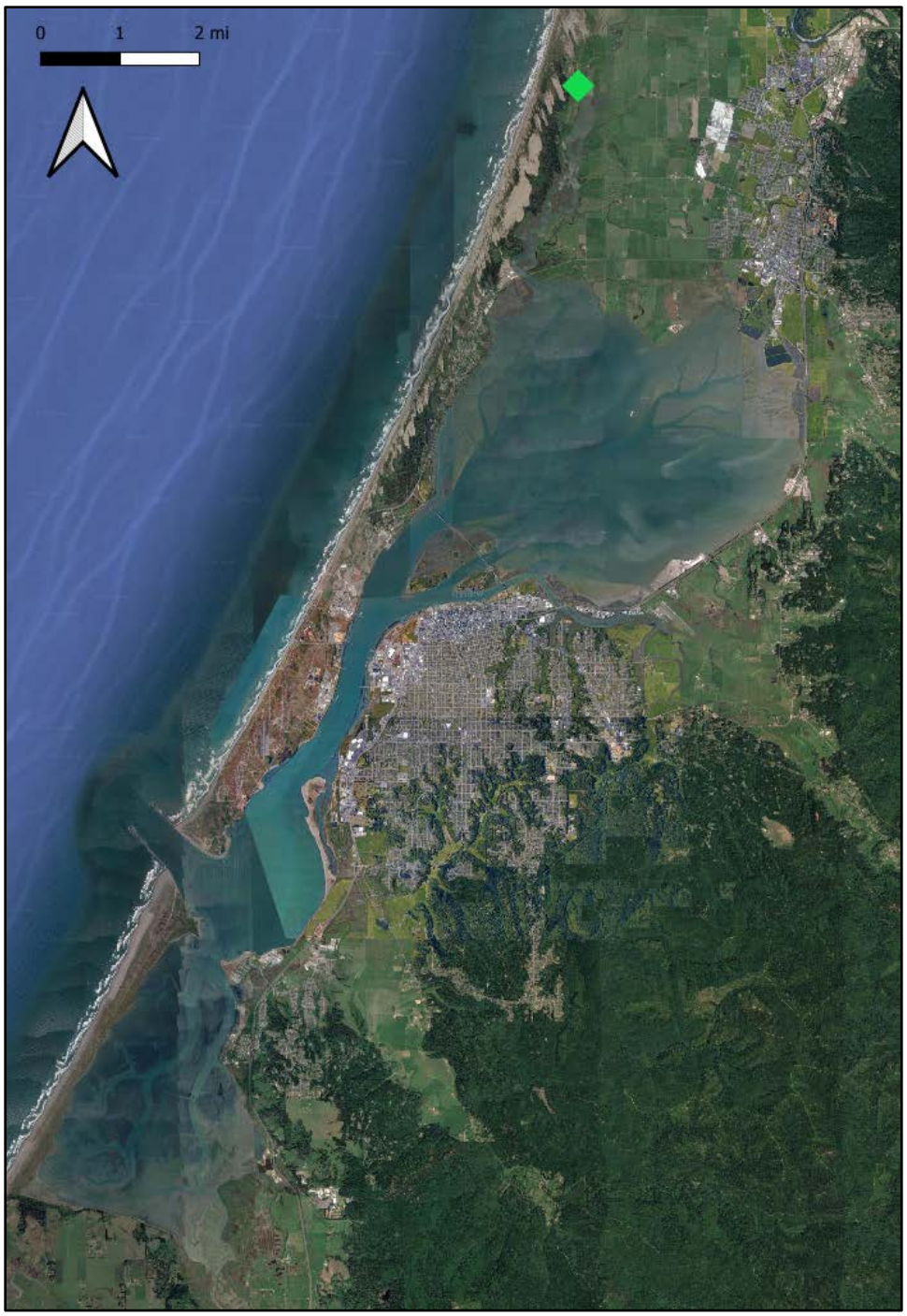

Figure 1. Mad River Slough Shellfish Nursery Project Vicinity Map (Imagery: Google Earth).

Figure 2. Location of proposed Mad River Slough Shellfish Nursery (Imagery: Google Earth, May 2019).

Section 3.0 Project Description

3.1 Project Scope and Objectives

The project objective is:

- Set and mature oyster and clam seed to be sold to farmers that will grow the shellfish to market size.

3.2 Best Management Practices

Best management practices/standard operating procedures that will be followed are summarized in Table 1 and discussed in the individual resource category sections where applicable.

Table 1. Proposed Best Management Practices.

#	Topic	BMP
BMP-1	Cultural Resources	The Project will comply with the Harbor District Protocol agreed upon between the Harbor District and the Blue Lake Rancheria, Bear River Band of Rohnerville Rancheria, and Wiyot Tribes regarding the inadvertent discovery of archaeological resources, cultural resources, or human remains or grave goods (Attachment A).
BMP-2	Vessel Maintenance and Fueling	Project personnel will maintain all vessels used in culture activities to limit the likelihood of release of fuels, lubricants, or other potentially toxic materials associated with vessels due to accident, upset, or other unplanned events. Project personnel will use marine grade fuel cans that are refilled on land, and personnel will carry oil spill absorption pads for use in the event of a spill.

3.3 Proposed Culture Species

The Project would serve as a nursery for Pacific oysters (*Crassostrea gigas*), Kumamoto oysters (*Crassostrea sikimea*), native "Olympia" oyster (*Ostrea lurida*) and Manila clams (*Venerupis philippinarum*). There are existing nurseries in Humboldt Bay that culture these species.

3.4 Proposed Project

The proposed project (Figure 3) would utilize a combination of existing and newly constructed mariculture equipment. Existing equipment includes an upland shellfish larvae setting facility and upwelling tanks. A new floating upwelling system ("FLUPSY") and water intake raft would be attached to existing anchors in Mad River Slough. The water intake raft would provide bay water

through pipes to the existing upland larvae setting facility and upwelling tanks. Bay water would be discharged to an existing "discharge ditch". Each component of the project is further described below.

3.4.1 Floating Upwelling System and Pump Raft

The FLUPSY would be a raft with a series of bins containing shellfish seed suspended into the water. It would be constructed mainly of wood and would be 20' X 24'. An electric paddle wheel would move water through the bins to create "upwelling" that is beneficial to growth of shellfish seed. On a regular basis, the bins would be hoisted with a davit out of the water and cleaned.

The pump raft would have open areas within which screened water intakes would be submerged. The raft would be 14' X 16'. The screens would be designed to avoid or minimize entrainment and impingement of aquatic species (Attachment B). On a regular basis, the water intakes and screens would be lifted and cleaned. A maximum of 600 gallons per minute (gpm) would be drawn from Mad River Slough and pumped to the existing upland larvae setting facility and upwelling tanks. Pumping would be restricted to the following seasonal maximum volumes:

- April – August: 600 gpm maximum
- September – October: 300 gpm maximum
- November – March: No pumping (0 gpm)

The intake screens are designed to protect juvenile salmonids, tidewater goby and other aquatic species from entrainment and impingement by including the following design features (see Attachment B for screen design details):

- Positioned mid-water column because tidewater goby are bottom dwelling.
- Approach velocity does not exceed ~~0.33~~ .04 feet per second.
- Screen mesh does not exceed ~~1/8~~ 3/32 inch.

3.4.2 Discharge

The site was designed to discharge water from the larvae setting facility and upwelling tanks to a discharge ditch that is connected to an estuarine wetland by a culvert. The ditch is connected to Mad River Slough by a culvert with a tide gate. Historically, discharge from facility operations has resulted in estuarine conditions in the ditch and wetland. Discharge from the proposed facility would maintain estuarine conditions within the ditch and wetland. The discharge rate would not exceed 600 gpm.

Between the months of April-July up to 60 gallons of the 600 gallons of water withdrawn may be warmed to 23.88° C / 74.98° F to facilitate setting of oyster larvae. The warmed water will be mixed with the unheated water prior to discharge to the ditch. Water temperature in the slough was monitored between April-July of 2020 and 2021 using a continuous temperature probe. Table 2 shows the temperature of discharge water based on (1) the measured temperatures of the slough

water; (2) the ratio of 60 gallons heated / 540 gallons not heated water; and (3) heating to 23.88° C / 74.98° F. The conservative mass balance equation used for this calculation is shown below.

T3=(Q1*T1+Q2*T2)/(Q1+Q2)

Q1=Heated water flow rate (60 gpm)
T1=Heated water temperature (74.98° F)
Q2=Unheated water flow rate (540 gpm)
T2=Unheated slough water temperature (°F)
T3=Temperature of mixed heated water and unheated water

Table 2. Discharge water temperatures when the Mad River Slough is at monthly minimum, maximum and average water temperatures (°F).

Month/Year	Min. Slough Temp.	Discharge Temp.	Max. Slough Temp.	Discharge Temp.	Ave. Slough Temp.	Discharge Temp.
April 2021	53.95	56.05	65.62	66.56	58.69	60.31
April 2022	51.72	54.05	65.32	66.29	56.56	58.41
May 2021	57.33	59.09	68.48	69.13	62.26	63.54
May 2022	56.38	58.24	66.77	67.59	61.12	62.51
June 2020	62.70	63.93	73.00	73.20	67.71	68.45
June 2021	62.32	63.59	71.75	72.07	67.29	68.05
July 2020	56.60	58.44	72.70	72.93	67.69	68.43
July 2021	63.30	64.47	71.70	72.03	67.41	68.16

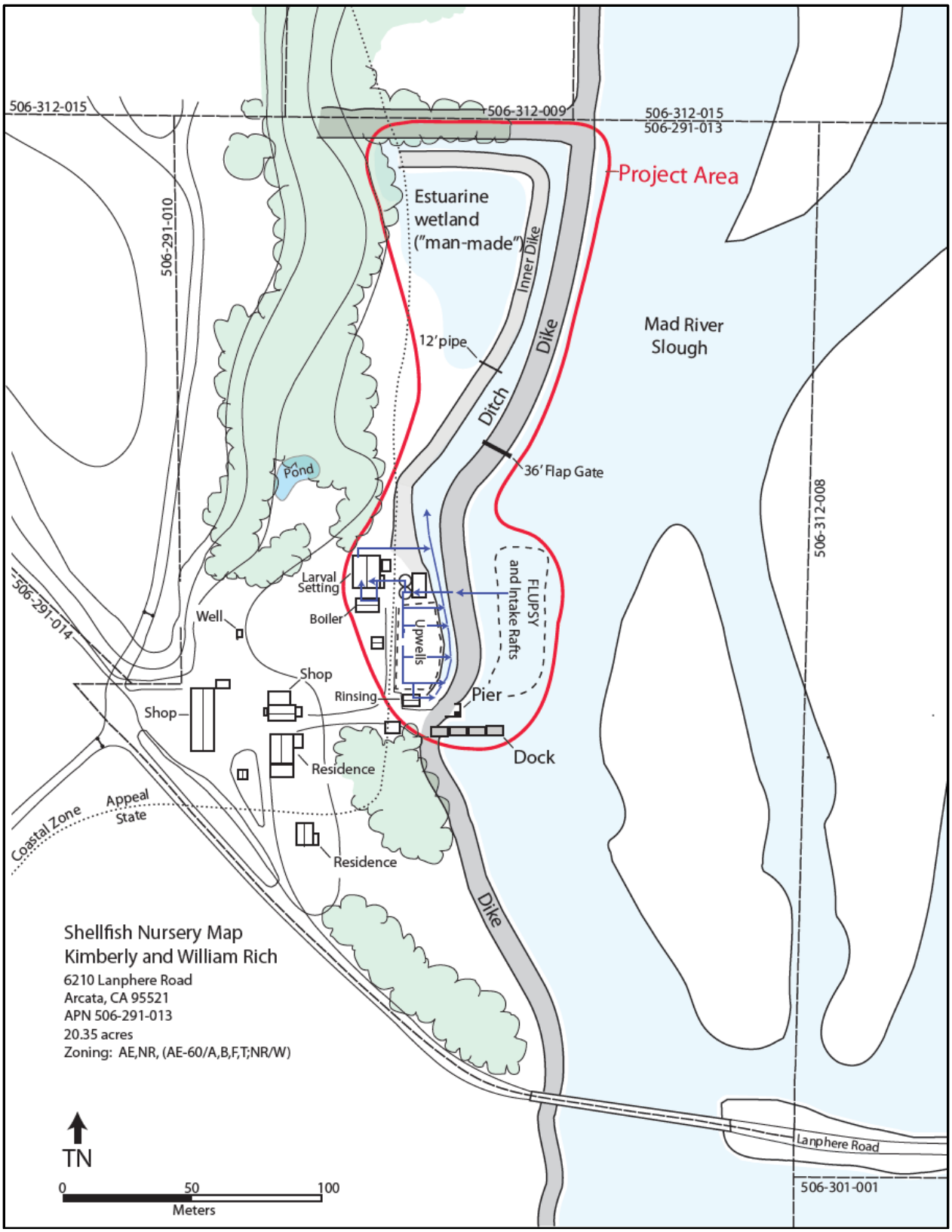

Figure 3. Proposed Mad River Slough Shellfish Nursery site layout.

Section 4.0 Checklist and Evaluation of Environmental Impacts

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

❑ Aesthetics	❑ Agricultural and Forestry Resources	❑ Air Quality
❑ Biological Resources	❑ Cultural Resources	❑ Energy
❑ Geology/Soils	❑ Greenhouse Gas Emissions	❑ Hazards & Hazardous Materials
❑ Hydrology/Water Quality	❑ Land Use/Planning	❑ Mineral Resources
❑ Noise	❑ Population/Housing	❑ Public Services
❑ Recreation	❑ Transportation	❑ Tribal Cultural Resources
❑ Utilities/Service System	❑ Wildfire	❑ Mandatory Findings of Significance

DETERMINATION: On the basis of this initial evaluation:

✓ I find that the proposed Project **would not** have any significant effects on the environment, and a **NEGATIVE DECLARATION** will be prepared.

❑ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A **MITIGATED NEGATIVE DECLARATION** will be prepared.

❑ I find that the proposed Project **may** have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT (EIR)** is required.

❑ I find that the proposed Project **may** have a "potentially significant impact" or 'potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An **EIR** is required, but it must analyze only those effects that remain to be addressed.

❑ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier **EIR** or **NEGATIVE DECLARATION** pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier **EIR** or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Humboldt Bay Harbor, Recreation and Conservation District

Date

I. AESTHETICS. Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A)	Have a substantial adverse effect on a scenic vista?				X
B)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
C)	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point." If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?)				X
D)	Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?				X

DISCUSSION

Aes-A: The only new structures that will be added by the project are the FLUPSY and upwelling raft. These rafts will only extend one foot above the water surface. They would be viewable from passing watercraft. Additionally, they may be viewable from Lanphere Road, which has limited public access and use. There are other raft structures in Mad River Slough. Additionally, the FLUPSY and raft would be near an existing dock. The structures would add to the working landscape character at the site and would not have a substantial adverse effect on a scenic vista. There will be no impact.

Aes-B: The project site is not located adjacent to a state-designated scenic highway and no scenic resources would be damaged. Therefore, there will be no impact.

Aes-C: The only new structures that will be added by the project are the FLUPSY and upwelling raft. These rafts will only extend one foot above the water surface. They would be viewable from passing watercraft. Additionally, they may be viewable from Lanphere Road, which has limited public access and use. There are other raft structures in Mad River Slough. Additionally, the FLUPSY and raft would be near an existing dock. The structures would add to the working landscape character at the site and would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. There will be no impact.

Aes-D: No permanent lighting will be installed as part of the project. Nursery workers may use flashlights and lanterns to conduct work during nighttime. However, this limited use of light would have a minor (not substantial) impact on nighttime views in the area and no impact on daytime views. There would be no impact.

II. AGRICULTURAL AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
B) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
C) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
D) Result in the loss of forest land or conversion of forest land to non-forest use?				X
E) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

DISCUSSION

Ag-A through Ag-E: The Project will have a beneficial effect on agricultural resources by increasing the footprint of shellfish culture in Humboldt Bay and providing seed for other shellfish growers. There would be no negative impacts on agricultural resources, and the proposed land use is consistent with existing zoning designated by the Humboldt County Code (Section 313-5.4). The Project will not convert forest or farmland. There will be no impact.

III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Conflict with or obstruct implementation of the applicable air quality plan?			X	
B) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?			X	
C) Expose sensitive receptors to substantial pollutant concentrations?			X	
D) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

DISCUSSION

Air-A and Air-B: The Project is located in the North Coast Air Basin and is under the jurisdiction of the North Coast Unified Air Quality Management District (NCUAQMD). The North Coast Air Basin is in "nonattainment" status with respect to particulate matter smaller than 10 microns in diameter (PM10) under California regulations, but is in attainment of all other State and federal ambient air quality standards.

Small vessels associated with shellfish aquaculture operations have combustion engines that generate particulate matter. The Project will involve the use of one vessel that will travel a very short distance (approximately 50 feet) between the Project dock, FLUPSY and pump raft. There would be 1-3 boat trips per day and approximately 1 gallon of fuel consumption per week. Additionally, the water intakes will use small submersible pumps. Pumping volumes are shown in Section 3.4.1 and each pump would intake approximately 100 gpm. All internal combustion engines that will be used have a power rating of 50 horsepower or less. The vessel engines and pumps would contribute to a minor and negligible increase in emissions of particulate matter.

The District lacks direct regulatory jurisdiction over air quality, and thus lacks direct authority to require mitigation for potential air quality impacts. However, the NCUAQMD regulates vessel engine emissions pursuant to several air quality plans. CEQA addresses circumstances such as this through reliance by lead agencies on the regulatory oversight of responsible agencies carrying out statewide policy. Specifically, State CEQA Guidelines Section 15064(h) establishes a procedure that allows lead agencies, including the District, to rely on the environmental standards promulgated by other regulatory agencies, such as the NCUAQMD, with respect to pollutant regulation. The NCUAQMD has adopted several air quality management plan elements, including a *PM10 Attainment Plan* (NCUAQMD 1995).

The Project will comply with the *PM10 Attainment Plan* adopted by the NCUAQMD and all attendant regulations. Hence, the impact will be less than significant.

Air-C and Air-D: The Project will not create any substantial pollution concentrations or objectionable odors. Additionally, there are no sensitive receptors or a substantial number of people in the immediate vicinity of the Project area. Therefore, the impact will be less than significant.

IV. BIOLOGICAL RESOURCES. Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?			X	
B) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?			X	
C) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	
D) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
E) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
F) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?				X

DISCUSSION

Bio-A-1: Direct Effects on Candidate, Sensitive, or Special-status Species. The following species may occur in the Project vicinity and are identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, by the CDFW as state-listed species, or are listed under the Endangered Species Act (ESA).

Common Name	Scientific Name	Status[1]
Fish		
Pacific lamprey	*Entosphenus tridentatus*	SSC
Green sturgeon, southern DPS	*Acipenser medirostris*	FT/CSSC. Designated critical habitat in Humboldt Bay.
White sturgeon	*A. transmontanus*	SSC
Coho salmon, southern Oregon, northern California ESU	*Oncorhynchus kisutch*	FT/ST
Chinook salmon, California coastal ESU	*Oncorhynchus tshawytscha*	FT
Steelhead, Northern California DPS	*Oncorhynchus mykiss*	FT
Coastal cutthroat trout	*Oncorhynchus clarki*	CSSC
Tidewater goby	*Eucyclogobius newberryi*	FE
Longfin smelt	*Spirinchus thaleichthys*	ST
Birds		
California brown pelican	*Pelecanus occidentalis californicus*	FP

Common Name	Scientific Name	Status[1]
Marine Mammals		
Harbor seal	*Phoca vitulina*	Protected under the Marine Mammal Protection Act (MMPA)
California sea lion	*Zalophus californiaus*	Protected under the MMPA
Notes: DPS = Distinct Population Segment; ESU = Evolutionarily Significant Unit. [1] Status abbreviations: FE = Federally listed as endangered; FT = Federally listed as threatened; ST = State-listed as threatened; CSSC = California Species of Special Concern; FP = Fully protected in California.		

Bio-A1. Direct Effects.

Following is a description of species identified above and certain potential project effects. Other potential effects are described in Bio-A2 through Bio-A4.

Fish

Pacific Lamprey. Pacific lamprey spend most of their life in fresh or marine water, rather than estuaries. There are numerous tributaries to Humboldt Bay which Pacific lamprey may use to spawn. Estuaries are important to Pacific lamprey for foraging, holding, and transitioning from freshwater to marine waters. However, the Project is located 2.5 miles up a tidal slough and not near any rivers within which Pacific lamprey may spawn. Pacific lamprey would not be significantly impacted by the Project. They could swim around or under nursery equipment. Additionally, the water intake screens (Attachment B) are designed to protect aquatic species, including Pacific lamprey, from entrainment or impingement.

Green Sturgeon. Moser and Lindley (2007) indicated that green sturgeon may use coastal bays as foraging habitat due to their high productivity. Based on acoustic tagging data conducted in 2007 and 2008 (USFWS unpublished data), green sturgeon move in channels, as would be expected for larger fish. However, 97% of observations occurred at two detection locations: Arcata Channel and North Bay Main Channel near the Samoa Bridge. Relatively few observations occurred in the Mad River Channel which extends to Mad River Slough where the Project is located. A follow-up survey of sturgeon use of Humboldt Bay by NMFS and USFWS (Goldsworthy et al. 2016) indicated that green sturgeon primarily use the Arcata Channel and were observed feeding on northern anchovy (*Engraulis mordax*). Sturgeon were also observed in the intertidal zone for short forays, potentially following anchovies into shallower habitat. These fish were originally tagged in the Sacramento River in 2011, and are considered part of the Southern Distinct Population Segment.

It is unknown if green sturgeon may occur in the Project vicinity. The Project is 2.5 miles up Mad River Slough and not in an area where green sturgeon have been recorded. The species may use the area for foraging. However, green sturgeon would not be significantly impacted by the Project. They could swim around or under nursery equipment without risk of entanglement. Additionally, the water intake screens (Attachment B) are designed to protect aquatic species, including green sturgeon, from entrainment or impingement.

White Sturgeon. The only known self-sustaining spawning population of white sturgeon in California is in the Sacramento River, although spawning is believed to also occur in the San Joaquin,

Klamath, and Eel rivers (Israel et al. 2009). While white sturgeon are not expected to spawn in any of the Humboldt Bay tributaries, adults and sub-adults likely use the bay for foraging habitat.

It is unknown if white sturgeon may occur in the Project vicinity. The Project is 2.5 miles up Mad River Slough and not in an area where white sturgeon have been recorded. The species may use the area for foraging. However, white sturgeon would not be significantly impacted by the Project. They could swim around or under nursery equipment without risk of entanglement. Additionally, the water intake screens (Attachment B) are designed to protect aquatic species, including white sturgeon, from entrainment or impingement.

Coho and Chinook Salmon, Steelhead, and Coastal Cutthroat Trout (Salmonids). Salmonid life history is characterized by periods of adult upstream migration, spawning and egg development, fry and juvenile development, juvenile downstream migration, and stream-estuary rearing. Adult salmonids are primarily in Humboldt Bay from November to April, and juveniles can be present year-round. There are smaller spawning streams in Humboldt Bay, and a critical salmonid spawning area located in the Eel River, which is south of Humboldt Bay along the coast. There are no river mouths near the Project area.

Salmonids use Humboldt Bay for foraging and migration. The Project is 2.5 miles up Mad River Slough, which would be a "detour" from migratory paths between spawning habitat (rivers) and the Pacific Ocean. Hence, the overwater structures are not expected to affect salmonid migration. The Project area may be used by salmonids for foraging so there is potential for entrainment and impingement by the pump raft's water intakes. However, entrainment and impingement will be avoided through use of a fish screen designed according to NMFS and CDFW fish screening standards for fingerling size salmonids (Attachment B). Smaller (fry) salmonids would not occur at the site because it is not near spawning habitat.

In water bodies other than Humboldt Bay, placement of overwater structures can attract predatory fish such as striped bass (*Morone saxatilis*), which predate on juvenile salmonids and other species. However, fish species such as striped bass, that have this predatory behavior and are attracted to overwater structure, are not present in Humboldt Bay.

Longfin Smelt. Longfin smelt are known to occur in Humboldt Bay, but little is known regarding their distribution, abundance, or life history. Longfin smelt forage on small organisms in the water column (e.g., phytoplankton, barnacle larvae, euphausids) and other small crustaceans (Gustafson et al. 2010), and are primarily pelagic fish.

Threats to longfin smelt include: reductions in freshwater inflow to the estuaries they inhabit; loss of larval, juvenile and adult fish at agricultural, urban, industrial, and local water diversions (usually located in freshwater areas of estuaries used by the species for spawning); direct and indirect impacts of non-native species on the longfin smelt food supply and habitat; lethal and sub-lethal effects of toxic chemicals; physical disruption of their spawning substrates and the habitat of their prey species (e.g., by dredging); and warming of estuary waters resulting from global climate

change. The project site does not contain areas of freshwater inflow nor will the project contribute to any of the identified threats to longfin smelt.

The Project area may be used by longfin smelt so there is potential for entrainment and impingement by the pump raft's water intake. However, juvenile longfin smelt entrainment and impingement will be avoided through use of a fish screen designed according to NMFS and CDFW fish screening standards (Attachment B). Larval longfin smelt would not occur in the Project area because they cannot survive the high salinities at the site or between the site and spawning habitat (i.e., larval longfin smelt occur in water with low salinities and gradually move into areas with higher salinity as they grow).

In water bodies other than Humboldt Bay, placement of overwater structures can attract predatory fish such as striped bass, which predate on longfin smelt and other species. However, fish species such as striped bass, that have this predatory behavior and are attracted to overwater structure, are not present in Humboldt Bay.

Tidewater Goby. Tidewater goby rarely exceed two inches in length. They inhabit the freshwater/saltwater interface where salinity is less than 12 parts per thousand. Tidewater goby are known to occur in Humboldt Bay, and may occur in the Project area, including within the discharge ditch and connected pond. Indeed, the discharge may create habitat that is beneficial for tidewater goby. Tidewater goby could potentially be entrained or impinged by the Project's water intakes but will be protected by the proposed water intake screen (Attachment B).

Birds

California Brown Pelican. The California Brown Pelican feeds in estuaries and nearshore ocean waters, plunge-diving to capture small schooling fishes near the water's surface. Pelicans roost on sandbars, pilings, jetties, breakwaters, and offshore rocks, sometimes in large communal roosts that can number in the thousands. In Humboldt Bay, roosting has been reported on Sand Island, oyster racks, jetties, mudflats, and manmade structures (Jaques et al. 2008).

Project personnel will not undertake any activity that would be defined as take or harassment of any protected species, including brown pelicans. The additional surface area provided by the pump raft and FLUPSY may provide resting areas for various bird species including California brown pelican.

Marine Mammals

Harbor Seal and California Sea Lion. Harbor seals are widely distributed throughout the northern Atlantic and Pacific oceans. They occur along coastal waters, river mouths, and estuaries. Harbor seals consume a variety of prey, but small fishes are predominate in their diet (Tallman and Sullivan 2004). Foraging occurs in a variety of habitats, from streams to bays/estuaries to the open ocean (Eguchi and Harvey 2005). Harbor seals breed along the Humboldt County coast and inhabit the area throughout the year (Sullivan 1980). Harbor seals use Humboldt Bay as a pupping and haul-out area (Ougzin 2013). There are no haul outs near the Project site.

California sea lions feed on fish and cephalopods, some of which are commercially important species such as salmonids, Pacific sardines (*Sardinops sagax*), northern anchovy, Pacific mackerel (*Scomber japonicus*), Pacific whiting (*Merluccius productus*), rockfish, and market squid (*Loligo opalescens*)). California sea lions do not breed along the Humboldt County coast. However, non-breeding or migrating adults may occur in Humboldt Bay year-round.

No seal haul out or pupping areas exist in the vicinity of the Project site. Project personnel will not undertake any activity that would be defined as take or harassment of any protected species, including marine mammals.

Based on the above analysis, the Project would have a less than significant direct impact on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

Bio-A2: Fouling Organisms and Nonnative Species. Fouling and non-indigenous species (NIS) concerns are associated with either the introduction of new NIS organisms to Humboldt Bay or providing habitat for and supporting the continuing expansion for NIS that are established in Humboldt Bay. There is also a concern that the cultured species themselves are non-native and could lead to naturalization into the bay.

Based on a previous survey in Humboldt Bay (Boyd et al. 2002), the nonnative species identified were from nine different groups: (1) marine algae, (2) sponges, (3) anemones, (4) limpets, (5) Pacific oysters (cultured), (6) copepods, (7) amphipods, (8) bryozoans, and (9) tunicates. The majority of introductions in Humboldt Bay were from the long history of maritime commerce, including both commercial shipping and shellfish aquaculture (e.g., introductions from ballast water or in marine algae historically used as packing material for oysters). Boyd et al. (2002) indicated that most organisms were likely present in Humboldt Bay for over 100 years, except for more recent introductions of some tunicates. This is consistent with the more recent introductions reported from Ruiz and Geller (2018). New introductions that were identified are primarily associated with commercial shipping activity, especially from vessels that transit between San Francisco Bay and Humboldt Bay.

One of the main ways in which historic oyster operations contributed to NIS in Humboldt Bay was from the shells of oyster spat imported from Japan. Beginning in the 1930's, the California Department of Fish and Game (now CDFW) helped to introduce Pacific oysters from Japan to revive the oyster industry in Humboldt Bay (Barrett 1963). Legacy introductions from this activity are evident from the pattern of exotic marine algae species found in Humboldt Bay.

While there are legacy introductions from oyster operations in Humboldt Bay, current operations involve several stringent management measures to avoid introductions. The hatcheries that export shellfish seed which will be used by the Project submit inspection reports on a regular basis to CDFW, and the importation of seed from established hatcheries is allowed only if the hatchery has a minimum 2-year history of documented absence of disease. The Project will only use new

equipment or equipment that has only been used in Humboldt Bay. Given these management measures to control for disease and NIS, it is unlikely that current oyster operations would result in new NIS introductions.

In terms of naturalization of the cultured species into Humboldt Bay, the proposed Project only involves nursery operations and shellfish will not reach a size at which they could spawn/reproduce.

Therefore, the Project would have a less than significant impact related to NIS.

Bio-A3: Effects to Carrying Capacity. Carrying capacity, also termed "ecological carrying capacity," is defined by Ocean Studies Board and NRC (2010) as:

> *The stocking or farm density above which 'unacceptable ecological impacts' begin to manifest. From a practical standpoint, this process begins with the level of culture that can be supported without leading to significant changes to ecological processes, species, populations or communities in the growing environment.*

The most robust carrying capacity analysis conducted in Humboldt Bay was created for the Humboldt Bay Mariculture Pre-Permitting Project (District and SHN 2015). This included an analysis of up to 1,202 acres of shellfish aquaculture operations in Arcata Bay (or 55.02 metric tons dry tissue weight), which were all modeled as adults to maximize potential filtration pressure. According to the analysis, filtration pressure was shown to range between 5% and 9%, which indicates that the "vast majority of carbon fixed by phytoplankton remains available to non-cultured species." In addition, the phytoplankton turnover rate was calculated to replace itself several times per day. Overall, the analysis concluded that the existing and proposed culture would have some cumulative effect on Humboldt Bay food resources, but there is an abundance of food available and cultured species will not significantly affect the food resources in the bay. This was considered a conservative result, given that the analysis only calculated change to phytoplankton and did not account for other sources of carbon productivity (e.g., detritus, benthic microalgae, biodeposits). Note that this analysis was based on significantly more shellfish aquaculture operations than currently exist or are proposed in Humboldt Bay.

Other indicators of ecological carrying capacity include poor growth and high mortality of cultured shellfish. There have been no reports of poor growing conditions for the existing cultured oysters in Arcata Bay. The proposed Project would have a minor effect on carrying capacity as it would only remove 600 gpm of water and the discharged water would still contain food resources (i.e., shellfish seed would not consume all the organic material and detritus in the bay water before the water is discharged). Therefore, impacts associated with carrying capacity reduction are less than significant.

Bio-A4: Effects to Water Quality. No additions (e.g., antibiotics) will be added to bay water used by the facility. Cultured shellfish will remove a portion of the organic material and detritus in the water and therefore there will be less organic material and detritus in the discharge water than the intake water. Additionally, to set shellfish seed, there will be a minor amount of water warming prior to discharge. As shown in Table 2 (see April 2022 row), the temperature of water entering the

discharge ditch is not expected to be more than 2.3° F greater than the temperature of the ditch water. As the temperature of the slough water warms, the difference between the temperature of the slough water and the discharge water decreases (i.e., there is the greatest difference in water temperature when the slough is the coldest). This minor change in water temperature is not expected to significantly impact the physiology or behavior of any special status species. The effect is less than significant.

Bio-B: Effects to Habitats. The Project will install a pump raft and FLUPSY. These structures will provide overwater structure which may serve as habitat for some aquatic species (e.g., perch). Anchors that will be used have been in place for over two decades and therefore no benthic habitat will be displaced by the Project. The sensitive plant species eelgrass (*Zostera marina*) is not present in the Project area and therefore will not be affected. Water discharged to the ditch would serve to maintain the high value estuarine habitat in the ditch and connected pond. The impact to habitat would be less than significant.

Bio-C: Effect on state or federally protected wetlands. The discharge ditch and connected pond would receive discharge water from the facility. The ditch and pond were specifically designed for the purpose of receiving this water and providing habitat to native wildlife, fish and plant species. The impact would be less than significant.

Bio-D: Interfere substantially with the movement of native species. The movement of native aquatic and terrestrial species would not be significantly impacted. All species will be able to easily move through, under and/or over the aquaculture facilities. The impact would be less than significant.

Bio-E: Local Policies. There are numerous riparian habitats and other sensitive natural communities that have been identified by local governments, CDFW, and USFWS in the vicinity of the Project area. These natural communities provide habitat for year-round and migrant species, recreation, environmental interpretation, and preservation of aesthetic resources. The City of Arcata's Marsh and Wildlife Sanctuary also provides wastewater treatment. Specific areas managed by local, state or federal entities protecting riparian habitats and other sensitive natural communities include:

- The Humboldt Bay National Wildlife Refuge Complex, owned and managed by the USFWS. https://www.fws.gov/refuge/humboldt_bay/
- The Arcata Marsh and Wildlife Sanctuary, owned and managed by the City of Arcata. https://www.cityofarcata.org/340/Arcata-Marsh-Wildlife-Sanctuary
- CDFW Ecological Reserves and Wildlife Areas: https://wildlife.ca.gov/Lands/Places-to-Visit: Including the following areas in Humboldt County: Big Lagoon Wildlife Area, Eel River Wildlife Area, Elk River Wildlife Area, Fay Slough Wildlife Area, Headwaters Forest Ecological Reserve, Mad River Slough Wildlife Area, and South Spit Wildlife Area

Plans protecting biological resources in the vicinity of the Project include the Local Coastal Programs, the Open Space Element of the *Humboldt County General Plan*, comprehensive conservation plans (CCPs), and recovery plans for listed species.

Local Coastal Programs and other relevant documents include:

- Humboldt Bay Management Plan, HBHRCD http://humboldtbay.org/sites/humboldtbay2.org/files/documents/hbmp2007/HumBayMgmtPLAN_print.pdf
- California Coastal Commission Sea Level Rise Policy Guidance, https://www.coastal.ca.gov/climate/slrguidance.html
- Humboldt Bay Sea Level Rise Adaptation Planning Project, HBHRCD http://humboldtbay.org/humboldt-bay-sea-level-rise-adaptation-planning-project
- Humboldt County Humboldt Bay Area Plan Sea Level Rise Vulnerability Assessment, https://humboldtgov.org/DocumentCenter/View/62872/Humboldt-Bay-Area-Plan-Sea-Level-Rise-Vulnerability-Assessment-Report-PDF
- Humboldt Bay Area Plan of the Humboldt County Local Coastal Program, https://humboldtgov.org/1678/Local-Coastal-Plan-Update
- Humboldt Bay National Wildlife Refuge Comprehensive Conservation Plan, https://www.fws.gov/refuge/Humboldt_Bay/what_we_do/planning.html
- California Eelgrass Mitigation Policy (CEMP), https://www.cakex.org/sites/default/files/documents/cemp_oct_2014_final.pdf
- Humboldt Bay Eelgrass Comprehensive Management Plan, http://humboldtbay.org/eelgrass-management-plan

These plans and policies call for providing maximum public access and recreational use of the coast; protecting wetlands, rare and endangered habitats, environmentally sensitive areas, tidepools, and stream channels; maintaining productive coastal agricultural lands; directing new development to already urbanized areas; protecting scenic beauty; and locating coastal energy facilities such that they have the least impact. The District's Humboldt Bay Management Plan includes objectives to expand the amount of sustainable aquaculture within Humboldt Bay (District 2007).

The *Humboldt County General Plan* was adopted October 23, 2017. The Biological Resources section of the Conservation and Open Space Elements describes the policies for preservation of natural resources, management of production of resources, outdoor recreation, and public health and safety.

The Project would not conflict with these plans and policies. Therefore, there would be no impact.

Bio-F: Conservation Plans. There are no habitat conservation plans (HCPs) or other community plans in the Project vicinity and the Project would not conflict with any such plan. Therefore, there would be no impact.

V. CULTURAL RESOURCES. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?			X	
B) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?			X	
C) Disturb any human remains, including those interred outside of formal cemeteries?			X	

DISCUSSION

CR-A through CR-C: The Project would be implemented in a subtidal area and an upland developed area where no cultural or historic resources are known to be present. No soil disturbance would occur as part of the Project. Although cultural and historic resources are not expected to occur, there are measures in place to provide an inadvertent discovery plan in the event that a resource is discovered. Specifically, the Project would comply with the following adopted Harbor District inadvertent discovery protocol:

> **BMP-1. Cultural Resources:** The Project will comply with the Harbor District Protocol agreed upon between the Harbor District and the Blue Lake Rancheria, Bear River Band of Rohnerville Rancheria, and Wiyot Tribes regarding the inadvertent discovery of archaeological resources, cultural resources, or human remains or grave goods (Attachment A).

Potential impacts to cultural resources would be less than significant.

VI. ENERGY. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?				X
B) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?				X

DISCUSSION

Energy-A and Energy-B:

The Project will use energy for a less than 50 horsepower small boat that will only travel a short distance (approximately 50 feet) between the Project dock, FLUPSY and pump raft. Additionally, the Project will use up to eight 1-horsepower pumps that will operate up to 24 hours per day. The amount of fuel required is a negligible increase in regional demand. This fuel use will not result in the need for new or expanded sources of energy or infrastructure to meet the energy demands of the Project. Energy use by the Project will not be wasteful or inefficient and it is necessary to produce food. The use also will not conflict or obstruct any state or local plan for renewable energy or energy efficiency. Therefore, the Project will have no impact.

VII. GEOLOGY AND SOILS. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			X	
ii) Strong seismic ground shaking?				X
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?				X
B) Result in substantial soil erosion or the loss of topsoil?				X
C) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
D) Be located on expansive soil, as defined by the California Building Code (2007), creating substantial direct or indirect risks to life or property?				X
E) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X
F) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?				X

DISCUSSION

Geo-A: Risks to People or Structures. There are numerous fault lines near the Project area, as well as the intersection of three tectonic plates. As such, the area is highly susceptible to seismic activity. However, the Project would not add any fixed structures to the landscape that would be susceptible to seismic damage, nor would it put existing structures at greater risk. The sediment could be subject to liquefaction, which would pose a minor risk to workers; however, the area is subtidal and workers or equipment would not be standing on the bay floor (they would be on boats or rafts). Therefore, impacts related to seismic risks are less than significant.

Geo-B: Erosion. The Project by its nature will not result in any erosion or loss of topsoil. Therefore, there will be no impact.

Geo-C: Instability. The Project will not involve the construction of any permanent structures, and will not affect the potential for onsite or offsite landslides, lateral spreading, subsidence, liquefaction, or collapse. Therefore, there will be no impact.

Geo-D: Expansive Soils. There may be expansive soils in the Project area; however, the project will not add enclosed or habitable structures (buildings) to the landscape. There will also be no substantial risk to life or property from Project development. Therefore, there will be no impact.

Geo-E: Wastewater Disposal. The Project does not involve the development of new wastewater disposal systems. Workers employed through the Project would use existing facilities (restrooms) at the Project site, which has adequate wastewater capacity. Therefore, there will be no impact.

Geo-F: Unique Paleontological Resource. The Project is located in a developed upland area and subtidal habitat of Humboldt Bay. While there may be paleontological resources the Project will not disturb the sediment surface in this project area. Therefore, there will be no impact.

VIII. GREEN HOUSE GAS EMISSIONS. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
B) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?				X

DISCUSSION

GHG-A: Greenhouse Gas Emissions. Greenhouse gas emissions would result from the use of a less than 50 horsepower small vessel and up to eight 1-horsepower pumps. The amount of greenhouse gases generated would be less than significant.

GHG-B: Plans, Policies, or Regulations Regarding Greenhouse Gases. State of California legislation (Senate Bill 375 and Assembly Bill 32) seeks to reduce greenhouse gas emissions through the practice of smart-growth or mixed-use development. The Project does not include any upland construction or mobile sources (other than the vessels and pumps described above) that could be a potentially significant source of greenhouse gas emissions. The Project would not conflict with plans, policies, or regulations on greenhouse gas emissions. Therefore, there will be no impact.

IX. HAZARDS AND HAZARDOUS MATERIALS. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
B) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
C) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
D) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X	
E) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?				X
F) Impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
G) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?				X

DISCUSSION

Haz-A through Haz-C: The only hazardous materials that would be associated with the Project are fuel and lubricants for a small vessel and pumps. Use of these materials is common in Humboldt Bay and does not represent a significant hazard to the environment or people. Project personnel would follow all current and standard safety and cleanup protocols for fueling and lubricating engines.

Impacts from hazardous materials used by the Project will be less than significant. There will be no impact for *Haz-C* because the Project area is not within one-quarter mile of an existing or proposed school.

Haz-D: The Project will occur on an already developed site and would not disturb soils. As such, it will not mobilize any hazardous materials, if they are present. The Project does not pose a significant threat to the public or environment and the impact will be less than significant.

Haz-E: The only nearby airport is Murray Field, which is a public airport approximately 6 miles from the Project. Airplanes landing and departing from this airport are not expected to be a hazard for Project workers. Therefore, there will be no impact.

Haz-F and Haz-G: The Project will not have any effect on an adopted emergency response plan or emergency evacuation plan because it will not impede emergency response or evacuation routes or procedures. Also, the Project nature (farming shellfish) does not create any risk of wildfires. Therefore, there will be no impact.

X. HYDROLOGY AND WATER QUALITY. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			X	
B) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?				X
C) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner, which would:				X
i) Result in substantial erosion or siltation no- or off-site;				X
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;				X
iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or				X
iv) Impede or redirect flood flows?				X
D) In flood hazard, tsunamic, or seiche zones, risk release of pollutants due to project inundation?			X	
E) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?				X

DISCUSSION

Hyd-A: Water Quality and Discharge Standards. The Project will increase shellfish aquaculture operations in Humboldt Bay. No additives, feed, or chemicals will be used in shellfish aquaculture operations (other than fuel for the work vessels). The discharge water will have less organic matter and detritus than the intake/bay water. As shown in Table 2, a minor amount of intake/discharge water warming will occur, the temperature of water entering the discharge ditch is not expected to be more than 2.3° F greater than the temperature of the ditch water. As the temperature of the slough water warms, the difference between the temperature of the slough water and the discharge water decreases (i.e., there is the greatest difference in water temperature when the slough is the coldest). This minor change in water temperature is not expected to significantly impact water quality. Best Management Practice 2 will further reduce the risk of fuel spills. The potential impact is less than significant.

> **BMP 2. Vessel Maintenance and Fueling:** Project personnel will maintain all vessels used in culture activities to limit the likelihood of release of fuels, lubricants, or other potentially toxic materials associated with vessels due to accident, upset, or other unplanned events.

Project personnel will use marine grade fuel cans that are refilled on land, and personnel will carry oil spill absorption pads for use in the event of a spill.

Hyd-B: The Project would not involve the use of groundwater. Therefore, there will be no impact.

Hyd-C: No aspect of the Project will substantially alter drainage patterns or result in erosion or siltation. There will be no impact.

Hyd-D: The project site is within and adjacent to Mad River Slough, which is in a tsunami hazard area. The Project will follow current standards for storage and use of potential pollutants, including hazardous material (i.e., fuel and lubricants) to minimize the risk release of pollutants due to project inundation. Hence, the potential impact will be less than significant.

Hyd-E: The nature of the Project will not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. As described under *Hyd-A*, the impact to water quality will be less than significant. Hence, there will be no impact.

XI. LAND USE AND PLANNING. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Physically divide an established community?				X
B) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				X

DISCUSSION

Land-A: The Project involves shellfish aquaculture operations in Humboldt Bay. There is no construction that would create a physical barrier to movement dividing an established community. Therefore, there will be no impact.

Land-B: The Humboldt County General Plan states: "At the present time the North Bay is the heart of the local aquaculture industry, and the resource protection policies in this section and elsewhere in this plan are designed to foster the expected growth of this industry" (Humboldt County 2017). The Project is consistent with the *Agricultural Exclusive*, *Natural Resources/Water* zoning of the site, as the Project is a form of agriculture. Therefore, there will be no impact.

XII. MINERAL RESOURCES. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?				X
B) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

DISCUSSION

Min-A and Min-B: The Project will increase shellfish aquaculture operations in Arcata Bay. It will have no effect on mineral resources. Therefore, there will be no impact.

XIII. NOISE. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X
B) Generation of excessive groundborne vibration or groundborne noise levels?				X
C) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X

DISCUSSION

Noise-A through Noise-C: The Project will increase shellfish aquaculture operations in Humboldt Bay. Its primary noise effect would be caused by the addition of a small vessel with an internal combustion engine. This would generate noise similar to that generated by other small vessels on the bay. The Project vessel would not be heard from sensitive receptors as there are no nearby sensitive receptors. There will be no impact.

XIV. POPULATION AND HOUSING. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and/or businesses) or indirectly (e.g., through extension of roads or other infrastructure)?				X
B) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X

DISCUSSION

Pop-A through Pop-B: The Project will increase shellfish aquaculture operations on Arcata Bay. It may employee up to two full time new employees, but the effect on population and housing would not be substantial. Therefore, there will be no impact.

XV. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Fire protection?				X
B) Police protection?				X
C) Schools?				X
D) Parks?				X
E) Other public facilities?				X

DISCUSSION

Pub-A through Pub-E: The Project would not create increased demand for public services. Up to 2 people would be employed; they would likely already live in the local community and so would not represent a new burden on public services. The effect would not be substantial. Therefore, there will be no impact.

XVI. RECREATION. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
B) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

DISCUSSION

Rec-A: The Project will not increase use of existing neighborhood and regional parks or other recreational facilities. Up to 2 people will be employed by the Project, but they would likely already live in the local community and so would not represent a new burden on recreational facilities. There would be no impact to existing neighborhood and regional parks or other recreational facilities from the Project.

Rec-B: Recreational Facilities. The Project does not include recreational facilities. Up to 2 people would be employed by the Project, but they would likely already live in the local community and so would not represent a new burden on recreational facilities. The additional people employed by the Project would not result in an expansion of a recreational facility. Hence, there will be no impact.

XVII. TRANSPORTATION. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?				X
B) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?				X
C) Substantially increase hazards due to a geometric design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
D) Result in inadequate emergency access?				X

DISCUSSION

Trans-A, Trans-B, and Trans-D: The Project would not increase the local population. Up to 2 people employed under the project would park at the Project site where there is ample parking (i.e., over 8 parking spots that could be used). There would not be a conflict with circulation system, transit, roadways, pedestrian facilities, CEQA guidelines, or emergency access. Therefore, there will be no impact.

Trans-C: The Project does not add to road features (e.g., sharp curves or dangerous intersections). There would be no impact.

XVIII. TRIBAL CULTURAL RESOURCES. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Would the project cause substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in the local register of historical resources as defined in Public Resources. Code Section 5020.1(k), or			X	
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.			X	

DISCUSSION

Tribe-A: Based on the NAHC Contact list, Tribes were notified to determine if they have concerns regarding the Project and/or would like to be consulted consistent with State Assembly Bill 52. The Wiyot Tribe and Blue Lake Rancheria responded that they do not have concerns regarding the Project as long as ground disturbance will not occur, which it will not. Bear River Band of the Rohnerville Rancheria Tribal Historic Preservation Officer indicated that the Mad River Slough vicinity is culturally important but expressed no specific concerns with the proposed project given no ground disturbance will occur.

The Project would not involve soil disturbance that could impact tribal resources if they are present. In addition, the Project will comply with the following adopted Harbor District inadvertent discovery protocol:

> **BMP 1. Cultural Resources:** Project personnel will comply with the Harbor District Protocol agreed upon between the Harbor District and the Blue Lake Rancheria, Bear River Band of Rohnerville Rancheria, and Wiyot Tribes regarding the inadvertent discovery of archaeological resources, cultural resources, or human remains or grave goods (Attachment A).

Therefore, potential impacts to tribal cultural resources will be less than significant.

XIX. UTILITIES AND SERVICE SYSTEMS. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas facilities, the construction or relocation of which could cause significant environmental effects?				X
B) Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?				X
C) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
D) Generate solid waste in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?				X
E) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?				X

DISCUSSION

Util-A through Util-C: Project employees (up to 2) would use the existing restrooms at the site. The Project would not discharge wastewater or stormwater or involve consumption of water. Therefore, no impact is expected.

Util-D and Util-E: The Project would not generate any substantial amount of solid waste. The only waste would be items used in the process of farming shellfish at the site such as rags and rope. Local landfills would have the capacity to accept this relatively small amount of waste. The Project would maintain compliance with federal, state, and local statutes and regulations related to solid waste. Therefore, there will be no impact.

XX. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Substantially impair an adopted emergency response plan or emergency evacuation plan?				X
B) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of wildfire?				X
C) require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				X
D) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?				X

DISCUSSION

Wildfire-A through Wildfire-D: The proposed Project occurs in a developed upland and a subtidal area. The nature of the Project (farming shellfish) does not pose a risk of creating wildfires. There will be no impact.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE.	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			X	
B) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).			X	
C) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?				X

DISCUSSION

Findings-A: No. The Project would not degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

Findings-B: No. As generally described above, shellfish aquaculture activities do not intrinsically have significant environmental effects. The assessment above is applicable within the context of current and other planned activities in Humboldt Bay. Improvements to water quality by having an industry that is dependent on excellent water quality conditions is a benefit to the bay overall. With the best management practices described in this IS document, the potential cumulative impacts will be less than significant.

Findings-C: No. The Project would increase the amount of shellfish aquaculture in Arcata Bay and no aspect of the project is expected to cause substantial adverse effects on human beings, either directly or indirectly.

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Section 6.0 List of Preparers

Doug Saucedo, Humboldt Bay Harbor, Recreation and Conservation District

Vanessa Blodgett, Humboldt Bay Harbor, Recreation and Conservation District

Adam Wagschal, Moffat & Nichol

Attachment A

Cultural Resources Inadvertent Discovery Protocol

PROTOCOLS FOR INADVERTENT ARCHAEOLOGICAL DISCOVERIES FOR GROUND DISTURBING PROJECT PERMITS, LEASES AND FRANCHISES ISSUED BY THE HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT, HUMBOLDT BAY, CALIFORNIA

April 22, 2015 (adopted 4/23/15 by Harbor District Commission)
(Contact Information Updated 7/12/22)

Background

Humboldt Bay is the ancestral heartland of the Wiyot Indians, whose native language is affiliated with the Algonquian language family and who had occupied the bay area for at least 2000 years by the time the first recorded European maritime explorers entered the Bay in 1806 and the first American towns were established in 1850. There are hundreds of known and undiscovered archaeological sites around Humboldt Bay that evidence Wiyot history and prehistory. Today, citizens of Wiyot ancestry are affiliated with three federally-recognized tribes located in the ancestral homeland: Blue Lake Rancheria; Bear River Band of the Rohnerville Rancheria; and the Wiyot Table at Table Bluff Reservation.

Applicable Laws

A number of State and Federal historic preservation laws, regulations and policies address the need to manage potentially significant and/or sensitive (e.g., human remains) archaeological and Native American resources identified during advance project or permit review or discovered inadvertently.

- California Environmental Quality Act (CEQA) – Requires analysis by the Lead Agency under CEQA, to determine if a proposed project will cause a significant impact to "historical resources" including archaeological and Native American sites. Project approval may be conditional, for example, avoidance or mitigation (data recovery) of known archaeological resources, monitoring of ground disturbing activities in identified sensitive areas by local Tribal Representatives and/or professional archaeologists, and implementation of protocols for inadvertent archaeological discoveries.

- Section 106 of the National Historic Preservation Act (NHPA) – Requires analysis by the Lead Federal Agency and consultation with the California State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), culturally affiliated Native American Tribes, and others, as appropriate, to "resolve adverse effects" on "historic properties" including archaeological and Native American sites. Section 106 is the key Federal historic preservation law, and final approval of the undertaking may be conditional as specified in a legally binding Agreement among the parties.

Several laws and their implementing regulations spell out evaluation criteria to determine what constitutes a significant 'site' or a significant 'discovery':

- California Register of Historical Resources criteria (California Code of Regulations, Title 14, Chapter 3, Section 15064.5), for archaeological and Native American resources qualifying for consideration under CEQA;

- National Register of Historic Places criteria (36 CFR 63), qualifying for consideration under Section 106 review and NEPA;

State laws call for specific procedures and timelines to be followed in cases when human remains are discovered on private or non-Federal public land in California. It includes penalties (felony) for violating the rules for reporting discoveries, or for possessing or receiving Native American remains or grave goods:

- Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code (PRC) outline requirements for handling inadvertent discoveries of human remains, including those determined to be Native American with or without associated grave goods, found on private or non-Federal public lands. PRC 5097.99 (as amended by SB 447) specifies penalties for illegally possessing or obtaining Native American remains or associated grave goods.

Another California law imposes strong civil penalties for maliciously digging, destroying or defacing a California Indian cultural or sacred site:

- California Native American Historic Resource Protection Act of 2002 (SB 1816, adding Chapter 1.76 to Division 5 of the PRC), imposes civil penalties including imprisonment and fines up to $50,000 per violation, for persons who unlawfully and maliciously excavate upon, remove, destroy, injure, or deface a Native American historic, cultural, or sacred site that is listed or may be listed in the California Register of Historic Resources.

Standard Mitigation Language for CEQA Initial Studies

The following language may be employed by the Humboldt Bay Harbor, Recreation and Conservation District (Harbor District) when cultural resources screening (e.g., comment by Wiyot area Tribal Historic Preservation Officers (THPOs), formal record searches, current cultural resources studies) indicates a particular permit, leasehold or franchise area under its jurisdiction does not have known archaeological sites, however, unknown buried artifacts and archaeological deposits may exist and be impacted by the proposed action.

CR-1 Should an archaeological resource be inadvertently discovered during ground-disturbing activities, the Tribal Historic Preservation Officers (THPO) appointed by the Blue Lake Rancheria, Bear River Band of Rohnerville Rancheria and Wiyot Tribe shall be immediately notified and a qualified archaeologist with local experience retained to consult with the Harbor District, the three THPOs, the Permitee and other applicable regulatory agencies to employ best practices for assessing the significance of the find, developing and implementing a mitigation plan if avoidance is not feasible, and reporting in accordance with the Harbor District's Standard Operating Procedures (SOP, below).

CR-2 Should human remains be inadvertently discovered during ground-disturbing activities, work at the discovery locale shall be halted immediately, the Harbor District and County Coroner contacted, and the Harbor District's SOP shall be followed, consistent with state law.

Standard Operating Procedures

The following standard operating procedures for addressing inadvertent archaeological discoveries shall apply to all phases and aspects of work carried out under the authority of the Harbor District for those parties that obtain a permit, lease or franchise for projects that involve ground-disturbing activities within its jurisdiction. It shall apply as well to the Harbor District's activities involving ground disturbances. In all cases, these SOPs shall apply to their respective employees, officers and agents, including contractors whose activities may potentially expose and impact significant or sensitive resources.

The intent is to avoid or minimize direct or indirect impacts to significant archaeological or Native American discoveries that may qualify for inclusion in the California Register of Historical Resources and/or the National Register of Historic Places.

These Protocols are intended to serve as standard guidelines to the Harbor District for compliance with CEQA and NHPA Section 106 requirements for considering inadvertent archaeological discoveries.

Responsibility for Retaining Services of As-Needed Professional Archaeologist

If an inadvertent discovery of archeological resources, human remains and/or grave goods occurs, the Harbor District or those parties that obtain a permit, lease or franchise shall be responsible for retaining as-needed services of a qualified Archaeologist, meaning the individual meets the Secretary of the Interior's Professional Standards for an Archaeological Principal Investigator and/or is listed as Registered Professional Archaeologist (see website at www.rpanet.org). The professional will provide as-needed services to conduct rapid assessments of potentially significant archaeological finds discovered during the Project implementation.

Designated Points of Contact (POC) for Notification of Discoveries

The Harbor District, those entities that obtain a permit, lease or franchise from the Harbor District, their construction contractor(s), and other applicable local, state or federal agencies shall each designate a representative who shall act as its official Point of Contact (POC) and who shall be notified immediately upon the inadvertent discovery of an archaeological find or the inadvertent discovery of human remains and /or grave goods during Project implementation.

The federally-recognized Blue Lake Rancheria, Bear River Band of the Rohnerville Rancheria and Wiyot Tribe each has citizens that recognize Wiyot ancestry. Each Tribe's appointed Tribal Historic Preservation Officer (THPO) is designated as the POC (below) and shall be immediately notified by the Harbor District's POC should an archaeological site (with or without human remains) be inadvertently discovered. The Harbor District POC is also listed below.

Designated Tribal and Harbor District Points-of-Contact (*updated 7/12/22)

Tribe	Address	Office Telephone	Contact Staff*
Blue Lake Rancheria	428 Chartin Road P.O. Box 428 Blue Lake, CA 95525	(707) 668-5101 x1037 DH: (831) 239-0253 JP: (707) 498-4453	Daniel Holsapple, THPO dholsapple@bluelakerancheria-nsn.gov Jacob Pounds, Asst. THPOs
Bear River Band of the Rohnerville Rancheria	266 Keisner Road Loleta, CA 95551	(707) 733-1900 x233 Fax (707) 733-1972 MM: (707) 267-4797	Melanie McCavour, THPO thpo@brb-nsn.gov; melaniemccavour@brb-nsn.gov Ana Canter, Asst. THPO
Wiyot Tribe	1000 Wiyot Drive Loleta, CA 95551	(707) 733-5055 Fax (707) 733-5601 Cell (707) 499-3943	Ted Hernandez, THPO ted@wiyot.us
Harbor District	601 Startare Drive, Eureka, CA 95501	RH: (707) 443-0801 DS: (707) 443-0801 Fax (707) 443-0800 VB: (707) 825-8260	Rob Holmlund, Development Director rholmlund@humboldtbay.org Vanessa Blodgett, Planner (Planwest) districtplanner@humboldtbay.org

Interested Tribal Representatives shall be invited to inspect a discovery site and meet with the Harbor District's and other applicable delegated POCs and Consulting Professional Archaeologist, as appropriate, to make a rapid assessment of the potential significance of a find and participate in the development and implementation of a Treatment Plan, as appropriate.

Note: In the event that Native American skeletal remains are discovered, State law specifies that the "Most Likely Descendent (MLD)" appointed by the NAHC has the authority to make recommendations for the final treatment and disposition of said remains and associated grave goods – see below.

A. SOP for Inadvertent Archaeological Discovery (General)

1. Ground-disturbing activities shall be immediately stopped if potentially significant historic or archaeological materials are discovered. Examples include, but are not limited to, concentrations of historic artifacts (e.g., bottles, ceramics) or prehistoric artifacts (chipped chert or obsidian, arrow points, groundstone mortars and pestles), culturally altered ash-stained midden soils associated with pre-contact Native American habitation sites, concentrations of fire-altered rock and/or burned or charred organic materials, and historic structure remains such as stone-lined building foundations, wells or privy pits. Ground-disturbing project activities may continue in other areas that are outside the discovery locale.

2. An "exclusion zone" where unauthorized equipment and personnel are not permitted shall be established (e.g., taped off) around the discovery area plus a reasonable buffer

zone by the Contractor Foreman or authorized representative, or party who made the discovery and initiated these SOP.

3. The discovery locale shall be secured (e.g., 24-hour surveillance) as directed by the Harbor District if considered prudent to avoid further disturbances.

4. The Contractor Foreman or authorized representative, or party who made the discovery and initiated these SOP, shall be responsible for immediately contacting by telephone the parties listed below to report the find:
   (a) the Harbor District's authorized POC and
   (b) the Applicant's (District's permittee, lease or franchise holder) authorized POC, and it's General Contractor's POC if applicable.

5. Upon learning about a discovery, the Harbor District's POC shall be responsible for immediately contacting by telephone the POCs listed below to initiate the consultation process for its treatment and disposition:
   (a) THPOs with Blue Lake Rancheria, Bear River Band and Wiyot Tribe; and Other applicable agencies involved in Project permitting (e.g., US Army Corps of Engineers, US Fish & Wildlife Service, California Department of Fish & Wildlife, etc.).

6. Ground-disturbing project work at the find locality shall be suspended temporarily while Harbor District, the three THPOs, consulting archaeologist and other applicable parties consult about appropriate treatment and disposition of the find. Ideally, a Treatment Plan will be developed within three working days of discovery notification. Where the project can be modified to avoid disturbing the find (e.g., through project redesign), this may be the preferred option. Should Native American remains be encountered, the provisions of State laws shall apply (see below). The Treatment Plan shall reference appropriate laws and include provisions for analyses, reporting, and final disposition of data recovery documentation and any collected artifacts or other archaeological constituents. Ideally, the field phase of the Treatment Plan may be accomplished within five (5) days after its approval, however, circumstances may require longer periods for data recovery.

7. The Harbor District's officers, employees and agents, including contractors, permittees, holders of leases or franchises, and applicable property owners shall be obligated to protect significant cultural resource discoveries and may be subject to prosecution if applicable State or Federal laws are violated. In no event shall unauthorized persons collect artifacts.

8. Any and all inadvertent discoveries shall be considered strictly confidential, with information about their location and nature being disclosed only to those with a need to know. The Harbor District's authorized representative shall be responsible for coordinating with any requests by or contacts to the media about a discovery.

9. These SOPs shall be communicated to the field work force (including contractors, employees, officers and agents) of those entities that obtain a permit, lease or franchise from the Harbor District, and such communications may be made and documented at weekly tailgate safety briefings.

10. Ground-disturbing work at a discovery locale may not be resumed until authorized in writing by the Harbor District.

11. In cases where a known or suspected Native American burial or human remains are uncovered:
    (a) The following contacts shall be notified immediately: Humboldt County Coroner (707-445-7242) and the property owner of the discovery site, and
    (b) The SOP for Inadvertent Discovery of Native American Remains and Grave Goods (B below) shall be followed.

B. SOP for Inadvertent Discovery of Native American Remains and Grave Goods

In the event that known or suspected Native American remains are encountered, the above procedures of SOP paragraph A for Inadvertent Archaeological Discovery (General) shall be followed, as well as:

1. If human remains are encountered, they shall be treated with dignity and respect. Discovery of Native American remains is a very sensitive issue and serious concern of affiliated Native Americans. Information about such a discovery shall be held in confidence by all project personnel on a need-to-know basis. The rights of Native Americans to practice ceremonial observances on sites, in labs and around artifacts shall be upheld.

2. Violators of Section 7050.5 of the California Health and Safety Code may be subject to prosecution to the full extent of applicable law (felony offense).

In addition, the provisions of California law (Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the California Public Resources Code) will be followed:

1. The Coroner has two working days to examine the remains after being notified of the discovery. If the remains are Native American, the Coroner has 24 hours to notify the Native American Heritage Commission (NAHC) in Sacramento at (916) 653-4082.

2. The NAHC is responsible for identifying and immediately notifying the Most Likely Descendant (MLD) of the deceased Native American. (Note: NAHC policy holds that the Native American Monitor will not be designated the MLD.)

3. Within 48 hours of their notification by the NAHC, the MLD will be granted permission by the property owner of the discovery locale to inspect the discovery site if they so choose.

4. Within 48 hours of their notification by the NAHC, the MLD may recommend to the owner of the property (discovery site) the means for treating or disposing, with appropriate dignity, the human remains and any associated grave goods. The recommendation may include the scientific removal and non-destructive or destructive analysis of human remains and items associated with Native American burials. Only those osteological analyses (if any) recommended by the MLD may be considered and carried out.

5. Whenever the NAHC is unable to identify a MLD, or the MLD identified fails to make a recommendation, or the property owner rejects the recommendation of the MLD and mediation between the parties by NAHC fails to provide measures acceptable to the property owner, he/she shall cause the re-burial of the human remains and associated grave offerings with appropriate dignity on the property in a location not subject to further subsurface disturbance.

C. SOP for Documenting Inadvertent Archaeological Discoveries

1. The Contractor Foreman or authorized representative, or party who made the discovery and initiated these SOP, shall make written notes available to the Harbor District describing: the circumstances, date, time, location and nature of the discovery; date and time each POC was informed about the discovery; and when and how security measures were implemented.

2. The Harbor District POC shall prepare or authorize the preparation of a summary report which shall include: the time and nature of the discovery; who and when parties were notified; outcome of consultations with appropriate agencies and Native American representatives; how, when and by whom the approved Treatment Plan was carried out; and final disposition of any collected archaeological specimens.

3. The Contractor Foreman or authorized representative shall record how the discovery downtime affected the immediate and near-term contracted work schedule, for purposes of negotiating contract changes where applicable.

4. If applicable, Monitoring Archaeologists and Tribal Representatives shall maintain daily fieldnotes, and upon completion, submit a written report to the Harbor District and the three Wiyot area THPOs.

5. Treatment Plans and corresponding Data Recovery Reports shall be authored by professionals who meet the Federal criteria for Principal Investigator Archaeologist and reference the *Secretary of the Interior's Standards and Guidelines for Archaeological Documentation* (48 FR 44734-44737).

6. Final disposition of all collected archaeological materials shall be documented in the final Data Recovery Report and its disposition decided in consultation with Tribal representatives.

7. Final Data Recovery Reports along with updated confidential, standard California site record forms (DPR 523 series) shall be filed at the Northwest Information Center of the California Historical Resources Information System and the Harbor District, with report copies provided to the three Wiyot area THPOs.

8. Confidential information concerning the discovery location, treatment and final disposition of Native American remains shall be prepared by the THPOs and forwarded to the Sacred Sites Inventory maintained by the NAHC.

Attachment B

Water Intake Screen Design

Phone: (707) 441-8855 **Email:** info@shn-engr.com **Web:** shn-engr.com
812 W. Wabash Avenue, Eureka, CA 95501-2138

Reference: 022132

August 7, 2023

Kim and Bill Rich
P.O. Box 184
Bayside, CA 95524

Subject: Mad River Slough Shellfish Nursery Humboldt Bay Intake Screens Design Report, Revision 1

Kim and Bill Rich:

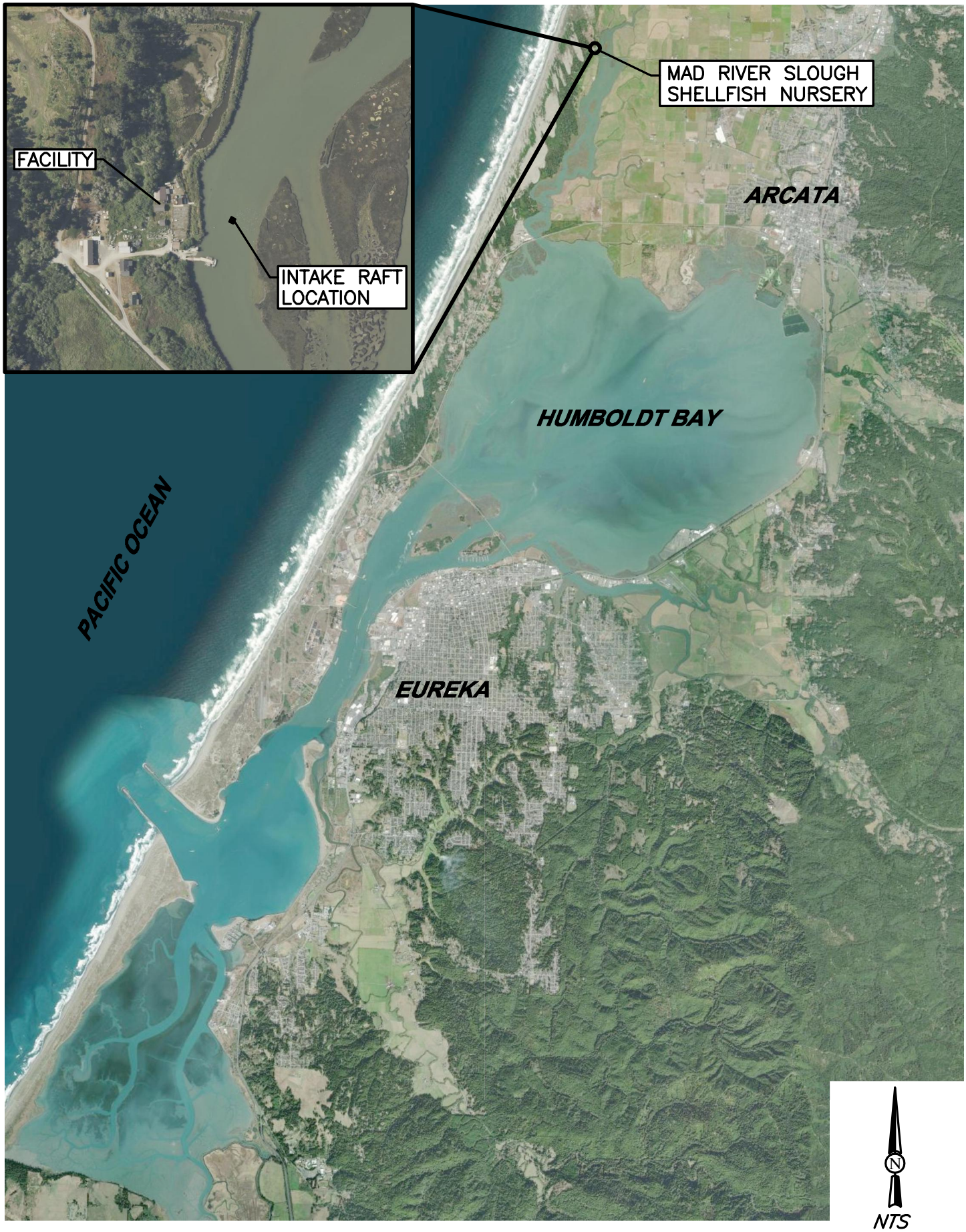
This report has been prepared for the proposed Mad River Slough pump intake screen design located in the Mad River Slough, Humboldt Bay, California. The Mad River Slough Shellfish Nursery (MRSSN) is proposing to withdraw up to 600 gallons per minute (gpm) of water from the Mad River Slough using small submersible pumps suspended below a floating raft. Each submersible pump will be placed inside a screen meeting design criteria to prevent fish entrainment and impingement. Figure 1 includes a site location map identifying the location of the proposed MRSSN and intake raft. The following report describes the applicable screen and intake structure design criteria, the design of the proposed screens and intake structure, and a preliminary operation and maintenance plan for the system.

Design Criteria

General intake screen design criteria for intakes located in tidal zones are outlined in the National Marine Fisheries Service (NMFS) documents: *Fish Screening Criteria for Anadromous Salmonids* for the Southwest Region (NMFS, 1997), and *Anadromous Salmonid Passage Facility Design* for the Northwest Region (NMFS, 2011); and in the California Department of Fish and Wildlife (CDFW) Exhibit "A" Department of Fish and Game Fish Screening Criteria (CDFW, 2000). Small variations exist between these three documents with respect to intake screen design in tidal areas, so the criteria listed below includes relevant criteria from all documents. Through consultation with the U.S. Fish and Wildlife Service (USFWS, 2022), it was determined that intake screens must meet the design criteria assuming the presence of anadromous salmonid fry and tidewater gobies. In addition to the USFWS recommended criteria, CDFW has provided guidance on design criteria assuming the presence of salmonids and longfin smelt, included below (Attachment 1).

A. Structure Placement

a. The screened intake shall be designed to withdraw water from the most appropriate elevation, considering juvenile fish attraction, appropriate water temperature control downstream, or a combination thereof. The design must accommodate the expected range of water surface elevations.



SHN	Bill and Kim Rich Mad River Slough Shellfish Nursery Mad River Slough, Humboldt Bay, California	Site Location Map SHN 022132
	April 2023 | 022132-SITE-LCTN	Figure 1

P:\Eureka\2022\022132-Rich-Aquaculture\Dwgs, SAVED: 4/21/2023 10:48 AM CNEWELL, PLOTTED: 4/21/2023 10:48 AM, NEWELL, CHRIS

b. Where possible, intakes should be located offshore to minimize fish contact with the facility. Water velocity from any direction toward the screen shall not exceed the allowable approach velocity. Where possible, locate intakes where sufficient sweeping velocity exists. This minimizes sediment accumulation in and around the screen, facilitates debris removal, and encourages fish movement away from the screen face.

B. Maximum Approach Velocity

a. CDFW recommends a maximum approach velocity of 0.2 feet per second (ft/s) for self-cleaning screens, and 0.05 ft/s for non-self-cleaning screens for protection of longfin smelt (Attachment 1).

C. Sweeping Velocity

a. Sweeping velocity shall be greater than approach velocity.

D. Flow Distribution

a. The screen design must provide for nearly uniform flow distribution over the screen surface, thereby minimizing approach velocity over the entire screen face. The screen designer must show how uniform flow distribution is to be achieved. Uniform flow distribution avoids localized areas of high velocity, which have the potential to impinge fish.

E. Screen Face Material

a. Perforated plate: CDFW recommends a pore size diameter shall be between 1.75-2.38 millimeters (mm; Attachment 1) for protection of longfin smelt. Perforated plate must be smooth to the touch with openings punched through in the direction of approaching flow.

b. Screen material shall provide a minimum of 27% open area.

c. The screen material shall be corrosion resistant and sufficiently durable to maintain a smooth and uniform surface with long term use.

F. Civil Works and Structural Features

a. Structural features shall be provided to protect the integrity of the fish screens from large debris. Trash racks, log booms, sediment sluices, or other measures may be needed. A reliable, ongoing, preventive maintenance and repair program is necessary to ensure facilities are kept free of debris and the screen mesh, seals, drive units, and other components are functioning correctly.

b. The civil works design shall attempt to eliminate undesirable hydraulic effects (for example, eddies, stagnant flow zones) that may delay or injure fish, or provide predator opportunities. Upstream training wall(s), or some acceptable variation thereof, shall be utilized to control hydraulic conditions and define the angle of flow to the screen face. Large facilities may require hydraulic monitoring to identify and correct areas of concern.

G. Passive Screens: A passive screen should only be used when all of the following criteria are met:

a. The site is not suitable for an active screen, due to adverse site conditions.

b. Uniform approach velocity conditions must exist at the screen face, as demonstrated by laboratory analysis or field verification.

c. The debris load must be low.

d. The combined rate of flow at the diversion site must be less than 3 cubic feet per second (cfs).

e. Sufficient ambient river velocity must exist to carry debris away from the screen face.

f. A maintenance program must be approved by NMFS and implemented by the water user.

g. The screen must be frequently inspected with debris accumulations removed, as site conditions dictate.

h. Sufficient stream depth must exist at the screen site to provide for a water column of at least one screen radius around the screen face.

i. The screen must be designed to allow easy removal for maintenance and to protect from flooding.

H. End of Pipe Screens (including pump intake screens)

a. End of pipe screens must be placed in locations with sufficient ambient velocity to sweep away debris removed from the screen face, or designed in a manner to prevent debris re-impingement and provide for debris removal.

b. End of pipe screens must be submerged to a depth of at least one screen radius below the minimum water surface, with a minimum of one screen radius clearance between screen surfaces and natural or constructed features.

c. A clear escape route should exist for fish that approach the intake volitionally or otherwise.

I. Operations and Maintenance

a. A reliable, ongoing inspection, preventative maintenance, and repair program is necessary to ensure facilities are kept free of debris and that screen media, seals, drive units, and other components are functioning correctly during the outmigration period. A written plan should be completed and submitted for approval with the screen design.

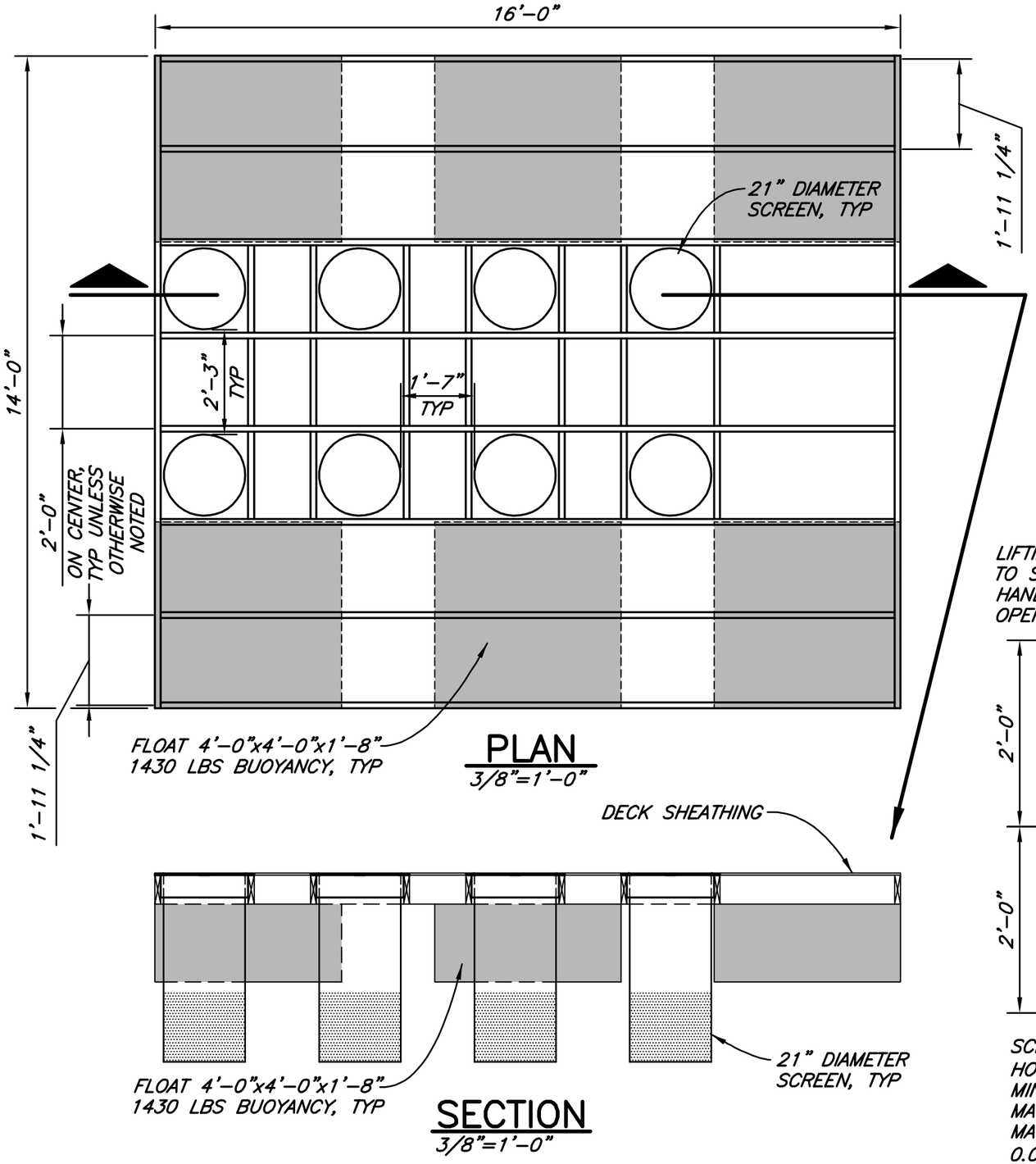
b. The completed screen and bypass facility shall be made available for inspection by NMFS to verify compliance with design and operational criteria.

c. Screen and bypass facilities shall be evaluated for biological effectiveness and to verify that hydraulic design objectives are achieved.

d. Intakes should be kept in good repair and inspected periodically to ensure they are clean and free of settling invertebrates, accumulated algae, or other debris, which could block portions of the screen surface and increase approach velocities.

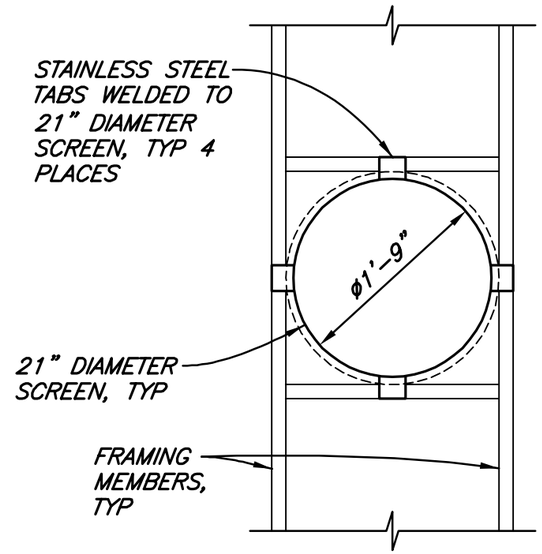
Intake Raft Design

The proposed MRSSN intake raft will be approximately 14 feet by 16 feet with eight holes for intake screens and pumps that can be suspended from the center of the raft (Figure 2). The screens will set into holes in the raft with custom-built brackets to hold them in place, and the pumps will set directly

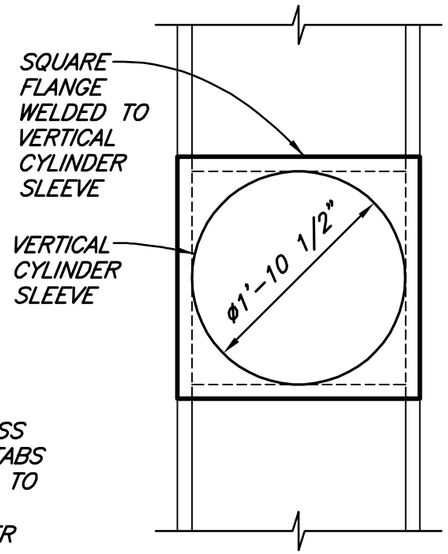


PLAN
3/8"=1'–0"

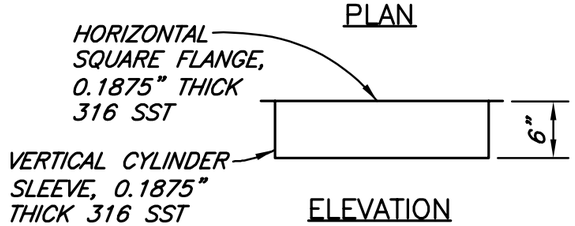
SECTION
3/8"=1'–0"



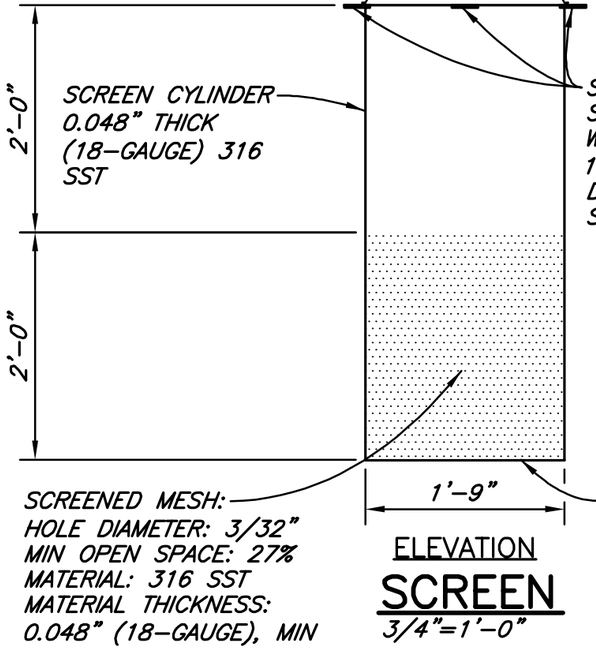
PLAN



PLAN



ELEVATION
VERTICAL CYLINDER
3/4"=1'–0"



ELEVATION
SCREEN
3/4"=1'–0"

SHN	Bill and Kim Rich Mad River Slough Shellfish Nursery Mad River Slough, Humboldt Bay, California	Intake Raft SHN 022132
	April 2023 | 022132-INTAKE-WATER-DIAG	Figure 2

P:\Eureka\2022\022132-Rich-Aquaculture\Dwgs, SAVED: 8/1/2023 10:56 AM CNEWELL, PLOTTED: 8/1/2023 10:56 AM, NEWELL, CHRIS

inside of the screens. The pumps and screens can be lifted out of the holes onto the raft for cleaning and maintenance.

The raft will be anchored near the midpoint of the slough channel to ensure sufficient water depth is available at all times. The channel is wide enough that the raft will not obstruct passage for small boats and kayaks that travel through the channel. The main channel is approximately 100 feet wide in the vicinity where the raft will be stationed. Pump power cables and water hoses will extend from the raft to the shore, suspended between the two in the water.

Intake Screen Design

The following sections describe critical intake screen design features that meet or exceed the associated NMFS design criteria. Figure 2 includes a detailed drawing of the intake screens.

Screen Perforation Diameter

U.S. Department of Fish and Wildlife Service staff has indicated that 1/8-inch mesh is adequate to protect tidewater goby from entrainment or impingement (USFWS, 2022). Additionally, based on the Fish Screening Criteria for Anadromous Salmonids (NMFS, 1997), 1/8-inch mesh is adequate to protect fingerling size salmonids from entrainment or impingement. Salmonid fry do not occur at the project site, because it is not near spawning habitat. CDFW has indicated that pore size diameter shall be between 1.75-2.38 mm such that a pore diameter of 2.38 mm (3/32 inch) has been selected for this project.

Approach Velocity

The MRSSN is proposing to withdraw up to a maximum of 600 gpm (864,000 gallons per day [gpd]) of water from the Mad River Slough. CDFW has indicated that a maximum approach velocity for non-self-cleaning screens of 0.05 ft/s shall be used. Applying the maximum allowable approach velocity of 0.05 ft/s, this requires a minimum total perforated screen surface area of 26.7 square feet. In order to accommodate manual cleaning of the screens and pumps, MRSSN is proposing to use multiple smaller intake screens with individual submersible pumps inside each screen. This will create a system where each screen and pump can be easily removed manually with minimal mechanical assistance.

Each screen will be a vertical cylinder mounted to a floating raft, with a perforated section below the water surface. Each screen will have 24 inches of perforated cylinder wall near the bottom of each cylinder, with a solid (non-perforated) bottom. The screen cylinders will be 21 inches in diameter such that each will have 11.0 square feet of perforated screen surface area.

The range of flows anticipated from each pump based on the manufacturer's pump performance curves, tidal water elevations, storage tank water elevations, and piping manifold friction losses, is anticipated to range from approximately 80-180 gpm. At 180 gpm, the maximum approach velocity through each screen will be approximately 0.04 ft/s (less than the maximum stipulated by CDFW of 0.05 ft/s).

Sweeping Velocity

The intake raft will sit in a tidal channel off of Humboldt Bay and will experience approximately two tide exchanges per day such that the sweeping velocity will change 180 degrees up to four times per day. The location and orientation of the raft will not have any effect on the sweeping velocity direction with respect to the vertically mounted cylindrical screens. Channel velocities measured on February 19, 2023, at approximately mid-tide (greatest tidal exchange velocity) were estimated at approximately 100 feet per minute (1.67 ft/s), which will prevent sediment and debris accumulation around the intakes. It should be noted that the location of the intake screens in the Mad River Slough does not experience a high amount of debris flow compared with other locations in Humboldt Bay. Humboldt Bay has many large eel grass beds that dislodge from the Bay mud seasonally and create large floating mats of eel grass that flow out with the tidal exchange. These mats do not typically make their way up the Mad River Slough. Also, larger debris such as logs that can be found in Humboldt Bay are not typically found in the Mad River Slough, so there is much less risk at this location for debris accumulation and interference with screen operation.

Intake Depth

The 4-foot length of each screen will allow the intake openings to remain at mid water column in the channel as specified by Bradley Nissen (USFWS, 2022). The proposed design includes 4-foot-tall screen cylinders with each cylinder top flush with the top of the raft. The framing of the raft will likely be 2-foot-by-8-foot dimensional lumber, with a height of approximately 7.5 inches. Below the framing, the foam floating blocks will be secured, each of which will be approximately 20 inches tall. This puts the submerged section of the intake screens between the water surface and approximately 20 inches below the water surface at all times. This does not account for the submergence of the foam floatation blocks, which will be submerged due to the weight of the raft, pumps, piping, and so on. So, the screens will likely sit lower than this in the water column, placing the screened area slightly lower than 20 inches below the water surface.

The bottom elevation of the slough in the area where the raft will be deployed is approximately -9.0 feet (NAVD 88) and the mean lower low water (MLLW) elevation is approximately -1.0 feet (NAVD 88). At MLLW, the water will be approximately 8.0 feet deep such that the bottom of the intake screens will be approximately 6.3 feet above the bottom of the slough. This will keep the intake screen at mid water column, provide room for sediment accumulation, and prevent the screens from drawing sediment from the bottom of the slough while maintaining complete submergence during all tides. Table 1 on the following page includes tidal water levels for the Mad River Slough.

Table 1. Mad River Slough Tidal Data[a]

Description	Abbreviation	Elevation (feet, NAVD88[a])
Mean Higher High Water	MHHW	6.63
Mean High Water	MHW	5.90
Mean Tide Level	MTL	3.13
Mean Low Water	MLW	0.34
Mean Lower Low Water	MLLW	-1.00

[a] National Oceanic and Atmospheric Administration (NOAA), 2023. Datums for 9418865, Mad River Slough, Arcata Bay, California.

Operation

The intake raft has been designed to include eight holes for pumps and screens to provide redundancy during maintenance and repairs. It is anticipated that a maximum of up to six pumps will be required to operate at one time during times when the maximum amount of water is required for facility operations. The number of pumps and required flow rate from each pump will be dependent on the need for water in various parts of the facility. The need for water will vary seasonally as the operation cycles through the various life stages of shellfish production.

Pumps will have manual controls allowing each to be placed into use as needed. Flow rates will be manually adjusted using valves and other appurtenances to maintain the appropriate flow rate for each process. Flows will be adjusted continuously during operation to account for any fluctuations in pumping rate due to the changing tide levels.

It is anticipated that all equipment attached to the floating intake raft will be removed annually around November when the salinity of the water falls below the threshold needed for shellfish production. Through the winter, the equipment will be cleaned and repaired to prepare for the following season's deployment.

Maintenance

Each screen and pump combination will be raised out of the water and will be pressure washed to remove fouling and debris every one to two days or as-needed. A pressure washer will be operated from a small boat lashed to the floating intake raft during pressure washing. Regular cleaning will ensure fouling does not obstruct the screen perforations to an extent that could cause the maximum approach velocity to be exceeded.

Please call us at (707) 441-8855 if you have any questions.

Sincerely,

SHN

Mike Foget, PE
Senior Engineer

Chuck Swanson
Project Manager

MKF:CRS:ame

References

California Department of Fish and Wildlife (CDFW). (2000). "Exhibit A Department of Fish and Game Fish Screening Criteria." NR:CDFW.

National Marine Fisheries Service (NMFS). (1997). *Fish Screening Criteria for Anadromous Salmonids*. National Marine Fisheries Service, Southwest Region:NMFS.

---. (2011). *Anadromous Salmonid Passage Facility Design*. National Marine Fisheries Service, Northwest Region, Portland, Oregon:NMFS.

National Oceanic and Atmospheric Administration (NOAA). (2023). Datums for 9418865, Mad River Slough, Arcata Bay CA. Accessed April 20, 2023 at: https://tidesandcurrents.noaa.gov/datums.html?datum=NAVD88&units=0&epoch=0&id=9418865&name=MAD+RIVER+SLOUGH%2C+ARCATA+BAY&state=CA

U.S. Fish and Wildlife Service (USFWS). (2022). *Personal communication*. Bradley Nissen, Fish and Wildlife Biologist, Ecological Services U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office:USFWS.

Attachment C

Initial Study Comment Letter from CA Dept. of Fish and Wildlife

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Marine Region
1933 Cliff Drive, Suite 9
Santa Barbara, CA 93109
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

July 19, 2023

Doug Saucedo, Natural Resources Coordinator
Humboldt Bay Harbor, Recreation and Conservation District
P.O. Box 1030, Eureka, CA 95502
dsaucedo@humboldt.org

SUBJECT: MAD RIVER SLOUGH SHELLFISH NURSERY PROJECT
INITIAL STUDY/NEGATIVE DECLARATION
SCH# 2023060574

Dear Mr. Saucedo,

The California Department of Fish and Wildlife (CDFW) received the Initial Study/Negative Declaration (IS/ND) from the Humboldt Bay Harbor, Recreation and Conservation District for the Mad River Slough Shellfish Nursery Project (Project) pursuant to the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife resources. Likewise, we appreciate the opportunity to provide comments regarding aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code (FGC).

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the state (FGC §711.7, subd. (a) and §1802; Pub. Resources Code §21070; CEQA Guidelines §15386, subd. (a)). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (*Id.*, §1802). Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources. CDFW is also responsible for marine biodiversity protection under the Marine Life Protection Act in coastal marine waters of California and ensuring fisheries are sustainably managed under the Marine Life Management Act.

[1] CEQA is codified in the California Public Resources Code in §21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with §15000.

Additionally, CDFW oversees and manages aquaculture activities in the State under the authority provided by the FGC (§§15000-15703) and Title 14 of the California Code of Regulations (CCR). All facilities devoted to the propagation, cultivation, maintenance, and harvesting of fish, shellfish, and plants in marine, brackish, and freshwater are required to register annually with CDFW (CCR §235). State law also requires permits from CDFW for various activities related to aquaculture operations, such as an Importation Permit to import most live aquatic plants and animals, in all forms (CCR §236). Statutory authorities for aquaculture disease and aquatic animal health management are embodied in FGC (§15500 et seq.).

PROJECT DESCRIPTION SUMMARY

Proponents: Humboldt Bay Harbor, Recreation and Conservation District (Harbor District; CEQA lead agency) and Kimberly and William Rich (Project sponsors)
Objective: The Mad River Slough Shellfish Nursery (MRSSN) proposes to set and mature oyster and clam seed that will be sold to farms for growing shellfish out to market size. The species proposed for culture include Pacific oysters (*Crassostrea gigas*), Kumamoto oysters, (*Crassostrea sikimea*), native Olympia oysters (*Ostrea lurida*) and Manila clams (*Venerupis philippinarum*). Existing equipment onsite includes an upland shellfish larvae setting facility and upwelling tanks. A new floating upwelling system (20ft x 24ft) and water intake raft (14ft x 16ft) would be attached to existing anchors in the Mad River Slough. The water intake raft would provide bay water through pipes to the upland larvae settling facility and upwelling tanks. The site would discharge bay water to an estuarine wetland that is connected to the Mad River Slough by a culvert with a tide gate. The intake and discharge rate would not exceed 600 gallons per minute (gpm).
Location: The Project site is located in the Mad River Slough, Arcata Bay.

BIOLOGICAL SIGNIFICANCE
Humboldt Bay is California's second largest bay, and the largest estuary on the Pacific coast between San Francisco Bay and Oregon's Coos Bay. The marine and estuarine habitats of Humboldt Bay provide refuge and nursery habitat for more than 300 fish and invertebrate species, many with important associated commercial and recreational fisheries. Humboldt Bay and its wetlands and dunes are habitat for at least 20 State- and federally listed species and numerous California Species of Special Concern (SSC). Sensitive species, including some listed as threatened or endangered pursuant to the California Endangered Species Act (CESA) or the Federal Endangered Species Act (ESA), or are listed as SSC, occur in the Project area. The Department designates certain species as SSC due to declining population levels, limited ranges, and/or continuing threats that have made them vulnerable to extinction. Species that occur in the Project area and protected under the CESA, ESA, or designated as SSC include:

- Coho salmon, *Oncorhynchus kisutch*, State and federally-threatened (Southern Oregon/Northern California (SONCC) Evolutionarily Significant Unit (ESU));

- Chinook salmon, *Oncorhynchus tshawytscha*, federally-threatened (California Coastal ESU);
- Coastal cutthroat trout, *Oncorhynchus clarki clarki*, State SSC;
- Steelhead trout, *Oncorhynchus mykiss*, federally-threatened (Northern California Distinct Population Segment (DPS)), State-endangered (Northern California Summer Steelhead);
- Longfin smelt, *Spirinchus thaleichthys*, State-threatened;
- Eulachon, *Thaleichthys pacificus*, federally-threatened (southern DPS);
- Green sturgeon, *Acipenser medirostris*, federally-threatened (southern DPS), State SCC (northern and southern DPS);
- Pacific lamprey, *Entosphenus tridentatus*, State SSC;
- Western river lamprey, *Lampetra ayresii*, State SSC; and
- Black brant, *Branta bernicla nigricans*, State SSC.

PROJECT IMPACTS

Bay Water Intakes
Comments: The volume of water withdrawn from the bay intakes for the MRSSN will vary throughout the year. The Project proposes to withdraw 600 gpm between April – August, 300 gpm between September – October, and no pumping between November – March. The intake screen design specifications include positioning the intakes in the mid-water column, a maximum approach velocity of 0.33 feet per second, and screen mesh size of 1/8 inch (3.2mm). However, this screen design does not follow the CDFW Fish Screening Criteria that is intended to protect California Endangered Species Act (CESA) listed species from intake systems. Additionally, the IS/ND does not indicate whether the screens will be self-cleaned or manually cleaned.

Recommendations:
To avoid impacts to CESA-listed species that occur in Humboldt Bay, including salmonids and longfin smelt (*Spirinchus thaleichthys*), all intakes utilized for the facility shall comply with the attached CDFW Fish Screening Criteria. Intakes in waters where longfin smelt may be present should include the following design specifications: 1) a pore size diameter between 1.75 – 2.38 mm depending on the configuration of pores, approach velocity of 0.2 feet per second for self-cleaning screens or 0.05 feet per second for non-self-cleaning screens, and screen porosity of at least 27%. Intakes should be kept in good repair and inspected periodically to ensure they are clean and free of settling invertebrates, accumulated algae, or other debris, which could block portions of the screen surface and increase approach velocities.

If intake screens are not designed following the CDFW Fish Screening Criteria, we recommend the Project proponents consult with CDFW to obtain an Incidental Take Permit (ITP) for juvenile and adult longfin smelt to address impacts of "take" pursuant to Fish and Game Code sections 2080.1 or 2081(b), and California Code of Regulations Title 14 (14

CCR) § 783 et seq. Additionally, if the Project description changes to include pumping during the winter months (November – March), CDFW recommends the Project proponents consult with CDFW regarding potential impacts to longfin smelt larvae and the potential for a 2081(b) Incidental Take Permit.

CONCLUSION

We appreciate the opportunity to comment on the Mad River Slough Shellfish Nursery Project to assist the Harbor District and Project sponsors in identifying and mitigating Project impacts on biological resources. Questions regarding this letter or further coordination should be directed to Corianna Flannery, Environmental Scientist at 707-499-0354 or Corianna.Flannery@wildlife.ca.gov.

Sincerely,

Craig Shuman, D. Env.
Marine Regional Manager

ATTACHMENT 1: California Department of Fish and Wildlife Fish Screen Criteria

cc: Office of Planning and Research, State Clearinghouse
state.clearinghouse@opr.ca.gov

ec: Cassidy Teufel, Senior Environmental Scientist (Specialist)
California Coastal Commission
Cassidy.Teufel@coastal.ca.gov

Melissa Kraemer, District Supervisor
California Coastal Commission
Melissa.Kramer@coastal.ca.gov

Elizabeth Pope, Humboldt Bay Watershed Steward
North Coast Regional Water Quality Control Board
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Matt Goldsworthy, Fisheries Biologist
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Kasey Sirkin, Lead Biologist
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Randy Lovell, Aquaculture Coordinator
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Randy.Lovell@wildlife.ca.gov

Habitat Conservation Project Branch CEQA Project Coordinator
California Department of Fish and Wildlife
ceqacommentletters@wildlife.ca.gov

Attachment D

Ca. Dept. of Fish and Wildlife
Email Correspondence Regarding
Revised Water Intake Screen Design

Wagschal, Adam

From: Flannery, Corianna@Wildlife <Corianna.Flannery@Wildlife.ca.gov>
Sent: Wednesday, August 9, 2023 11:51 AM
To: Wagschal, Adam
Cc: Kim Rich; Wilkins, Eric@Wildlife; Ota, Becky@Wildlife; Lovell, Randy@Wildlife; Briley, Sara@Wildlife; Teufel, Cassidy@Coastal; Kraemer, Melissa@Coastal; Pope, Elizabeth@Waterboards; 'matt.goldsworthy@noaa.gov'; Sirkin, L K CIV USARMY CESPN (USA); Nissen, Bradley D; Gard, Mark@Wildlife; Chuck Swanson
Subject: RE: CDFW comments - Mad River Slough Shellfish Nursery IS/MND

Appreciate the detailed response, Adam. Makes sense.

Corianna Flannery | Environmental Scientist
California Department of Fish and Wildlife – Marine Region
Environmental Review and Water Quality Project
619 Second St., Eureka, CA 95501
Cell: (707) 499-0354
Corianna.Flannery@wildlife.ca.gov
www.wildlife.ca.gov

From: Wagschal, Adam <awagschal@moffattnichol.com>
Sent: Wednesday, August 9, 2023 11:13 AM
To: Flannery, Corianna@Wildlife <Corianna.Flannery@Wildlife.ca.gov>
Cc: Kim Rich <krich1072@gmail.com>; Wilkins, Eric@Wildlife <Eric.Wilkins@wildlife.ca.gov>; Ota, Becky@Wildlife <Becky.Ota@wildlife.ca.gov>; Lovell, Randy@Wildlife <Randy.Lovell@wildlife.ca.gov>; Briley, Sara@Wildlife <Sara.Briley@Wildlife.ca.gov>; Teufel, Cassidy@Coastal <Cassidy.Teufel@coastal.ca.gov>; Kraemer, Melissa@Coastal <Melissa.Kraemer@coastal.ca.gov>; Pope, Elizabeth@Waterboards <Elizabeth.Pope@Waterboards.ca.gov>; 'matt.goldsworthy@noaa.gov' <matt.goldsworthy@noaa.gov>; Sirkin, L K CIV USARMY CESPN (USA) <L.K.Sirkin@usace.army.mil>; Nissen, Bradley D <bradley_nissen@fws.gov>; Gard, Mark@Wildlife <Mark.Gard@Wildlife.ca.gov>; Chuck Swanson <cswanson@shn-engr.com>
Subject: RE: CDFW comments - Mad River Slough Shellfish Nursery IS/MND

WARNING: This message is from an external source. Verify the sender and exercise caution when clicking links or opening attachments.

Hi Cori,

We did assess the alternative of using a self-cleaning screen and opted for the finer mesh non-self-cleaning screen, mainly based on the following:

- Quotes we have received for similar self-cleaning screenings are over $150k
- Increased weight would require a larger raft with increased environmental effects and cost
- Increased energy use
- More complicated equipment to maintain

It's a small operation and I don't think the expense, weight and complexity of a self cleaning screen makes sense in this case.

Adam

Adam Wagschal
Senior Coastal Planner

Moffatt & Nichol
M 707-496-2088

From: Flannery, Corianna@Wildlife <Corianna.Flannery@Wildlife.ca.gov>
Sent: Wednesday, August 9, 2023 10:46 AM
To: Wagschal, Adam <awagschal@moffattnichol.com>; Doug Saucedo <dsaucedo@humboldtbay.org>
Cc: Kim Rich <krich1072@gmail.com>; Wilkins, Eric@Wildlife <Eric.Wilkins@wildlife.ca.gov>; Ota, Becky@Wildlife <Becky.Ota@wildlife.ca.gov>; Lovell, Randy@Wildlife <Randy.Lovell@wildlife.ca.gov>; Briley, Sara@Wildlife <Sara.Briley@Wildlife.ca.gov>; Teufel, Cassidy@Coastal <Cassidy.Teufel@coastal.ca.gov>; Kraemer, Melissa@Coastal <Melissa.Kraemer@coastal.ca.gov>; Pope, Elizabeth@Waterboards <Elizabeth.Pope@Waterboards.ca.gov>; 'matt.goldsworthy@noaa.gov' <matt.goldsworthy@noaa.gov>; Sirkin, L K CIV USARMY CESPN (USA) <L.K.Sirkin@usace.army.mil>; Nissen, Bradley D <bradley_nissen@fws.gov>; Gard, Mark@Wildlife <Mark.Gard@Wildlife.ca.gov>; Chuck Swanson <cswanson@shn-engr.com>
Subject: RE: CDFW comments - Mad River Slough Shellfish Nursery IS/MND

Thank you, Adam. We appreciate the revisions made to the screen design to meet CDFW standards. One question from our hydraulic engineer is why the site isn't suitable for an active screen with a cleaning system, given that power is right on site (power going to the pumps)? It's fine for a passive screen, given the approach velocity is so low, but we still like to have active screens when possible. The ideal cleaning system would be brush arms, which just need power. Other options are air burst or water burst.
Thanks,
Cori

Corianna Flannery | Environmental Scientist
California Department of Fish and Wildlife – Marine Region
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From: Wagschal, Adam <awagschal@moffattnichol.com>
Sent: Tuesday, August 8, 2023 1:54 PM
To: Flannery, Corianna@Wildlife <Corianna.Flannery@Wildlife.ca.gov>; Doug Saucedo <dsaucedo@humboldtbay.org>
Cc: Kim Rich <krich1072@gmail.com>; Wilkins, Eric@Wildlife <Eric.Wilkins@wildlife.ca.gov>; Ota, Becky@Wildlife <Becky.Ota@wildlife.ca.gov>; Lovell, Randy@Wildlife <Randy.Lovell@wildlife.ca.gov>; Briley, Sara@Wildlife <Sara.Briley@Wildlife.ca.gov>; Teufel, Cassidy@Coastal <Cassidy.Teufel@coastal.ca.gov>; Kraemer, Melissa@Coastal <Melissa.Kraemer@coastal.ca.gov>; Pope, Elizabeth@Waterboards <Elizabeth.Pope@Waterboards.ca.gov>; 'matt.goldsworthy@noaa.gov' <matt.goldsworthy@noaa.gov>; Sirkin, L K CIV USARMY CESPN (USA) <L.K.Sirkin@usace.army.mil>; Nissen, Bradley D <bradley_nissen@fws.gov>; Chuck Swanson <cswanson@shn-engr.com>
Subject: RE: CDFW comments - Mad River Slough Shellfish Nursery IS/MND

Some people who received this message don't often get email from awagschal@moffattnichol.com. Learn why this is important

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Thank you Cori.

I attached an engineer's report which describes the revised screen design that now meets the recommended CDFW standards. I am in the process of updating the Initial Study to reflect this.

Adam

Adam Wagschal
Senior Coastal Planner

Moffatt & Nichol
M 707-496-2088

From: Flannery, Corianna@Wildlife <Corianna.Flannery@Wildlife.ca.gov>
Sent: Thursday, July 20, 2023 12:14 PM
To: Doug Saucedo <dsaucedo@humboldtbay.org>; Wagschal, Adam <awagschal@moffattnichol.com>
Cc: Kim Rich <krich1072@gmail.com>; Wilkins, Eric@Wildlife <Eric.Wilkins@wildlife.ca.gov>; Ota, Becky@Wildlife <Becky.Ota@wildlife.ca.gov>; Lovell, Randy@Wildlife <Randy.Lovell@wildlife.ca.gov>; Briley, Sara@Wildlife <Sara.Briley@Wildlife.ca.gov>; Teufel, Cassidy@Coastal <Cassidy.Teufel@coastal.ca.gov>; Kraemer, Melissa@Coastal <Melissa.Kraemer@coastal.ca.gov>; Pope, Elizabeth@Waterboards <Elizabeth.Pope@Waterboards.ca.gov>; 'matt.goldsworthy@noaa.gov' <matt.goldsworthy@noaa.gov>; Sirkin, L K CIV USARMY CESPN (USA) <L.K.Sirkin@usace.army.mil>; Nissen, Bradley D <bradley_nissen@fws.gov>
Subject: CDFW comments - Mad River Slough Shellfish Nursery IS/MND

CAUTION: This email originated from outside of the organization.

Good afternoon,

Please see the attached letter from the Department of Fish and Wildlife regarding the Harbor District's Mad River Slough Shellfish Nursery Project Initial Study/Negative Declaration. The Department's Fish Screening Criteria is also attached. Please contact me if you have any questions.

Thank you,

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