

Appendix D:

Proposed Benthic Habitat Mitigation Plan



To: Brendan Thompson, North Coast Regional Water Quality Control Board
cc: Cassidy Teufel, California Coastal Commission
Greg Dale, Coast Seafoods/Pacific Seafoods

From: Marlene Meaders, Phil Bloch, and Chris Czesla

Date: December 6, 2016

Re: Mitigation Plan for PVC Posts and Marker Stakes for the Proposed Coast Expansion Project in Humboldt Bay, California

Enclosures: Appendix A – Bracut Marsh Mitigation (Redwood Community Action Agency)

This technical memorandum is a response to comments from the North Coast Regional Water Quality Control Board (Regional Water Board) on the 401 Water Quality Certification application associated with Coast Seafoods Company's (Coast) Humboldt Bay Shellfish Aquaculture: Permit Renewal and Expansion Project (Project). The application was sent to Regional Water Board on July 12, 2016. In addition, the Project has been through several revisions of public documents to which the Regional Water Board provided comments, including a Draft Initial Study (Draft IS), Draft Environmental Impact Report (DEIR), and Revised DEIR (R-DEIR). Specifically, this technical memorandum responds to the following comment from the Regional Water Board:

The Regional Water Board has determined that the placement of "stakes" "posts" or other material that is permanently placed into sediment within wetlands (waters of the state) is a "fill" and requires appropriate review and regulatory permitting from our agency. These regulatory measures may include Clean Water Act section 401 Water Quality Certification, Water Discharge Requirements (WDRs) or Waiver of WDRs as necessary. Additionally, the proposed placement of approximately "1.03 acres of additional benthic footprint" (P. 37, Bio-A9) of this fill material may permanently impact wetland functions and beneficial uses causing significant impacts to the environment and may necessitate mitigation measures. These measures may include appropriate agency permitting and possibly compensatory mitigation in order to comply with the Clean Water Act and state and federal "no net loss" wetlands policies.

For this Project, “fill” is defined as the amount of sediment surface that placement of polyvinyl chloride (PVC) posts and marker stakes would displace in the proposed culture areas. Existing culture operations also have PVC posts, marker stakes, and anchors (for the floating culture), but these activities were previously evaluated by the Regional Water Board in 2007 and 2012, at which time it was determined that Coast’s operations would not result in a change as compared to existing conditions that required compensatory mitigation (WDID No. 1B0114OWNDN). The following information includes a brief project description, calculation of fill area, and proposed mitigation plan to satisfy permit conditions for the Regional Water Board.

1.0 PROJECT BACKGROUND

The Project site is in Humboldt Bay, California (Figure 1). The Project area is located within intertidal and subtidal habitat of North Bay and Central Bay, and current and proposed culture is primarily located within intertidal habitat of North Bay. Intertidal areas include substrates exposed during lower tides and submerged during higher tides. Table 1 provides a breakdown of the habitat areas associated with the existing and proposed culture operations. The location of both the existing and proposed operations is provided in Figure 2, and the proposed action is described more thoroughly in the R-DEIR.

Table 1 General Habitat Categories by Culture Method for Existing and Proposed Expansion of Culture in Humboldt Bay Associated with Coast Seafoods

Area	Total Subtidal Habitat (acre)	Total Intertidal Habitat (acre)
Existing Culture		
Other	1.0*	4.8
Cultch-on-Longline	[0.1]	282.7
Basket-on-Longline	0.0	11.2
Total Culture	1.0	298.7
Proposed Culture (Expansion) - Phase I		
Rack-and-Bag	0.0	4.0
Cultch (10-ft double-hung)	0.0	150.0
Cultch (10-ft single-hung)	0.0	6.0
Basket-on-Longline (9-ft)	0.0	50.0
Total Culture	0.0	210.0
Proposed Culture (Expansion) - Phase II		
Cultch (10-ft single-hung)	[4.1]	407.9

Source: Dale, pers. comm., 2016; NOAA 2012

*Some of the existing subtidal culture (e.g., FLUPSY, wet storage floats, clam rafts) occurs in Central Bay, although for summarization purposes it is listed in this table.

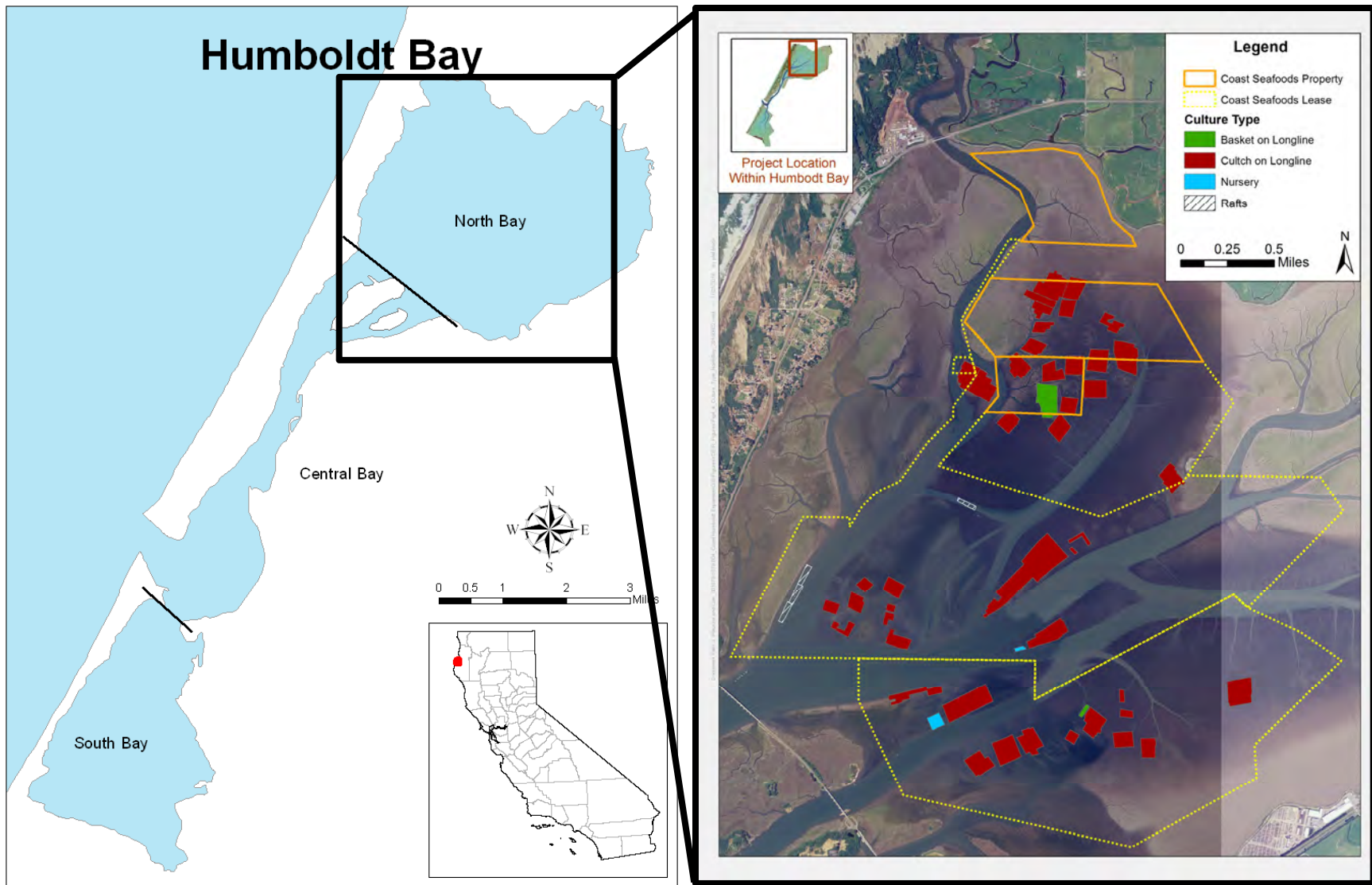


Figure 1 Location of Humboldt Bay, California, and Existing Shellfish Aquaculture

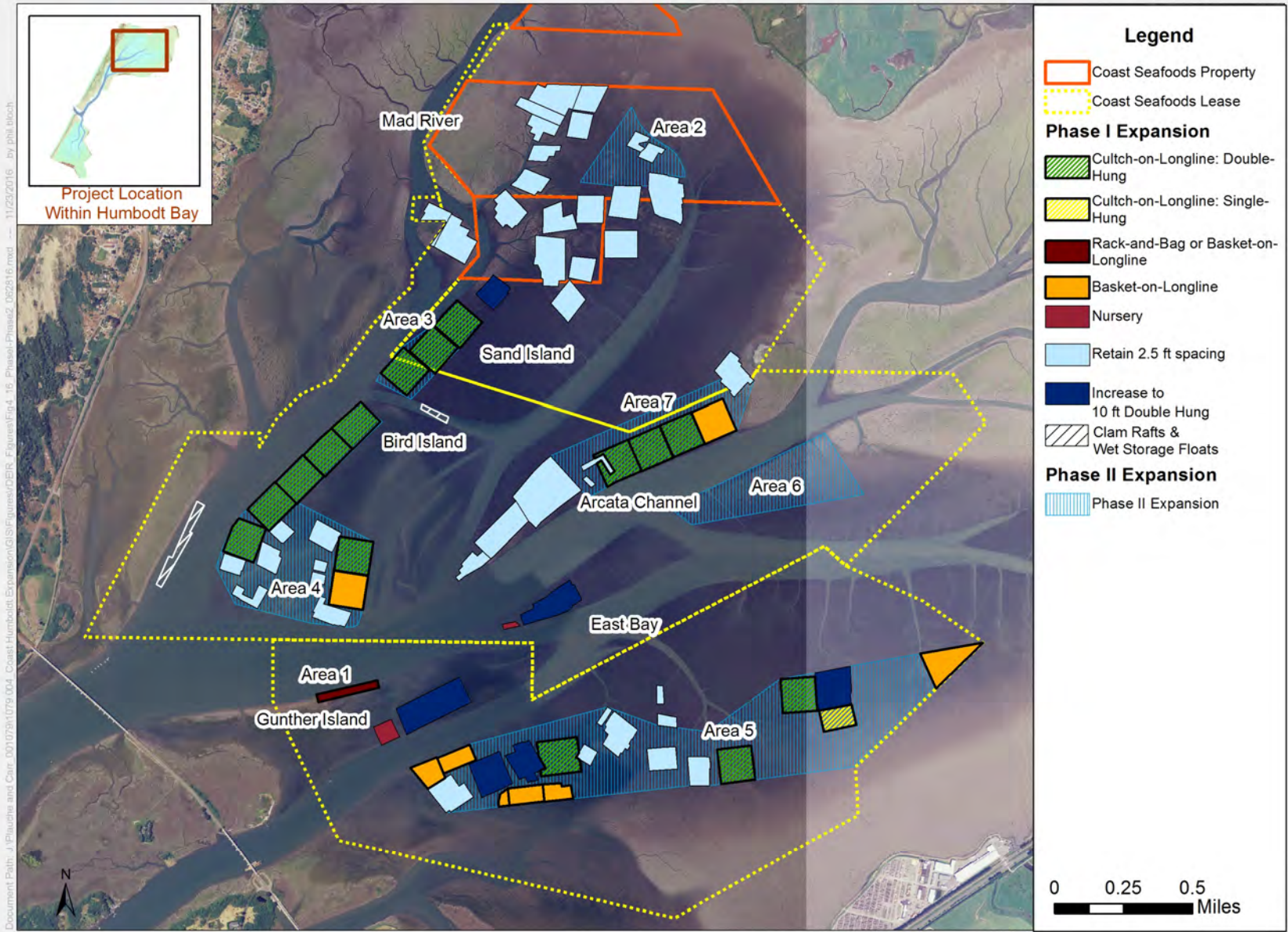


Figure 2 Existing Culture Area (light blue and dark blue), Proposed Phase I and Phase II Expansion Area, and 100 acre Conversion Area (dark blue) within Existing Culture Area

2.0 CALCULATION OF FILL AREA

There are three main types of gear used for either the existing or proposed operations: (1) PVC posts, (2) PVC marker stakes, and (3) anchors. Each type of gear is described below.

2.1 PVC Posts

There are two different types of PVC support posts that are proposed for longline aquaculture. The first is $\frac{3}{4}$ -inch diameter PVC used for cultch-on-longline culture and the second is 2-inch diameter PVC used for basket-on-longline culture. In addition, the support for rack-and-bag structures use $\frac{1}{2}$ -inch diameter posts (lumped into the general term "PVC" for all culture). There are 41 posts per line for cultch-on-longline and 13 posts per line for basket-on-longline. There are 6 posts per rack for the rack-and-bag culture. The total number of PVC support posts is provided below in the calculation methods.

2.2 PVC Marker Stakes

Each corner of a culture plot is marked with a permanent 2-inch diameter PVC marker stake that is marked with reflective tape. Certain culture plots near high traffic areas include additional marker stakes to provide more visibility and encourage avoidance by other Bay users. Coast also uses certain marker stakes to identify the type and/or date of shellfish planted. Coast estimates that it uses approximately 300 marker stakes for its existing cultivated area and that it would use approximately 144 stakes for the expansion area. This calculation is based upon the average number of marker stakes used per bed (approximately 6) multiplied by the number of beds (approximately 50 existing beds and 24 proposed beds).

2.3 Anchors

Anchors are used for the existing floating culture, including the floating upwelling system (FLUPSY), clam rafts, and wet storage floats. The FLUPSY is located on the west side of the entrance channel south of the Simpson wood chip loading dock in Fairhaven, 200 yards from the shoreline, and has 2 anchors. The clam rafts are located along the west side of the entrance to Mad River Slough Channel opposite Bird Island, approximately $\frac{1}{2}$ mile north of the Samoa/Hwy 255 bridges, and have a total of 33 anchors. The wet storage floats are in the "cut across" channel between Bird Island and Mad River and include 2 anchors. Overall, there is a total of 37 anchors used for the existing floating culture operations.

2.4 Calculation Methods and Results

The amount of gear in the substrate was calculated using standard equations for area. Using the equation for the area of a circle ($A=\pi r^2$), and the total number of PVC support posts and marker stakes, the acreage associated with the amount of PVC in North Bay for the existing and

proposed Project was calculated in Table 2. The amount of PVC support posts and marker stakes that would be added from the proposed Project to the substrate is approximately 0.08 acres after the conversion from 2.5-ft spaced lines to 10-ft double-hung longlines.

The anchors vary a little by size (some are 24 inches x 36 inches and some are 36 inches x 36 inches), but to be conservative we assumed they are all approximately 3 feet x 3 feet. Therefore, for a total of 37 anchors, the area occupied by Coast's anchors for its existing FLUPSY, clam rafts, and wet storage floats, is approximately 333 square feet (ft²). The total acreage for the intertidal nursery areas is 4.8 acres, although the amount of area fluctuates throughout the year depending on the amount of cultch available for out-planting. This estimate is also conservative, given that Coast's pallets never occupy the entire 4.8-acre area, even at maximum capacity.

The fill area for the proposed expansion of PVC posts and marker stakes will be mitigated, as described below. Because the existing gear is considered part of the environmental baseline, and was evaluated during the previous 401 water quality certification process (WDID No. 1B0114OWNDN), no mitigation is provided for the existing culture operations.

3.0 MITIGATION PLAN

The mitigation associated with placement of PVC posts and marker stakes would expand upon the mitigation used for the Coast Seafood hatchery project (Coastal Commission Application No. 9-16-0033). Coast would work with the National Resources Services Division of Redwood Community Action Agency (RCAA) to provide invasive cordgrass (*Spartina densiflora*) assessment, treatment, and monitoring services. The mitigation project would increase below-ground net primary productivity, including non-vascular autotrophs and benthic microalgae in the State Coastal Conservancy's 3.5-acre Bracut Marsh site in Eureka, California (Appendix A).

The proposed Project does not totally remove habitat, but rather displaces a small area directly adjacent to the structure that itself can be colonized by epibenthic invertebrates, and as such there is not a set mitigation ratio for this type of activity. The mitigation ratio recommended below was based on a review of projects related to coastal wetlands that was developed for NOAA (King and Price 2004) and a review of past mitigation projects by the California State Water Quality Control Board (Ambrose et al. 2006). While this document discusses total removal of habitat for use by fisheries and other marine resources, it is the best surrogate that we could identify for the proposed activity. Using a mitigation ratio of 3.0:1 for concurrent enhancement of existing habitat, and an impact area of 0.08 acres, Coast would need to expand the *Spartina* removal effort by 0.24 acres to incorporate the proposed expansion Project.

Table 2 Calculated Fill Area for PVC Support Posts and Marker Stakes in the Existing and Proposed Culture Areas

Culture Method	Cultch-on-Longline		Basket-on-Longline		Rack-and-Bag		Marker Stakes		TOTAL		
	# of PVC	Fill Area (Acre)	# of PVC	Fill Area (Acre)	# of PVC	Fill Area (Acre)	# of Markers	Fill Area (Acre)	# of PVC	# of Markers	Fill Area (Acre)
Existing Culture											
Existing Intertidal Culture (294 acres)	1,558,415	0.11	6,097	0.003	N/A	N/A	300	0.0002	1,564,512	300	0.11
Proposed Expansion Culture											
Conversion (100 acres)	-247,803	-0.02	N/A	N/A	N/A	N/A	N/A	N/A	-247,803	N/A	-0.02
Phase 1 Expansion (210 acres)	515,911	0.04	26,000	0.01	71,280	0.002	49	0.00002	613,191	49	0.05
Phase 2 Expansion (412 acres)	709,457	0.05	N/A	N/A	N/A	N/A	95	0.0001	709,457	95	0.05
Total Expansion (Phase 1 + Phase 2)	977,565	0.07	26,000	0.01	71,280	0.002	144	0.0001	1,074,845	144	0.08
Existing + Expansion	2,535,980	0.18	32,097	0.02	71,280	0.002	444	0.0003	2,639,357	444	0.19

4.0 REFERENCES

- Ambrose, R.F., J.C. Callaway, and S.F. Lee. 2006. An evaluation of compensatory mitigation projects permitted under Clean Water Act Section 401 by the California State Water Control Board, 1991-2002. Prepared for the State of California, California Environmental Protection Agency, California State Water Resources Control Board. Contract Number 03-259-250-0. August 2006.
- Dale, G. 2016. Personal communication regarding Coast Seafoods operations. Coast Seafoods Company. July 2016. GDale@coastseafoods.com
- King, D.M. and E.W. Price. 2004. Developing defensible wetland mitigation ratios: A companion to "the five-step wetland mitigation ratio calculator." King and Associates, Inc. Prepared for Kathi Rodrigues, NOAA, Office of Habitat Conservation, Habitat Protection Division, Silver Spring, Maryland.
- NOAA (National Oceanic and Atmospheric Administration). 2012. 2009 Humboldt Bay, California habitat spatial data. NOAA, Digital Coast, Office for Coastal Management URL: <http://www.csc.noaa.gov/digitalcoast/data/benthiccover> (accessed 15 August 2012).
- Wagschal, A. 2015. Personal communication regarding shellfish aquaculture in Humboldt Bay, Coast Seafoods operations, 20-year tide data and gear exposure analysis, and maps for the technical report. H.T. Harvey & Associates. August 2015. awagschal@harveyecology.com

Redwood Community Action Agency



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Coast Seafood Company
Attn: Greg Dale, Southwest Operations Manager
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RE: Scope and Fee Proposal – Bracut Mitigation Marsh Scope of Work and Fee Proposal

Dear Greg Dale:

The Natural Resources Services Division of Redwood Community Action Agency (RCAA), proposes to provide invasive cordgrass (*Spartina densiflora*) assessment, treatment, and monitoring services to Coast Seafood Company to effect an increase in below-ground net primary productivity, including non-vascular autotrophs and benthic micro-algae (Lagarde , 2012) in the State Coastal Conservancy's 3.5-acre Bracut Marsh site in Eureka, CA.

RCAA is a local 501 (3) c non-profit organization and a California licensed landscape contractor (License # 518874). We have been a co-coordinator and a primary treating entity of the *Humboldt Bay Regional Spartina Eradication Plan and Programmatic EIR* (State Coastal Conservancy and H.T. Harvey & Associates, 2012) and have a long track record of collaboration with the Humboldt Bay Harbor, Conservation and Recreation District (Harbor District), State Coastal Conservancy (SCC), Humboldt Bay National Wildlife Refuge (FWS), County of Humboldt (County), local municipalities, and Tribes engaged in invasive cordgrass management in the salt marshes of Humboldt Bay.

RCAA's approach to this project will include five (5) years of continuous treatment of cordgrass which has established within the inboard portion of the 3.5-acre Bracut marsh since its construction in the 1980's. Past spartina mapping (H.T. Harvey & Associates, 2012) indicates that spartina in Bracut Marsh is within 61-100% cover class in the tidal range slightly above and below mean high or higher water (MHHW). Ocular estimation of current area occupied by spartina in Bracut Marsh is between 0.5 and 0.75 acres. It is assumed that removal of this spartina will increase net primary productivity to a degree which mitigates productivity degradation related to the Coast Seafood hatchery project.

This scope of work includes four tasks and sub-tasks described below and correlating with appended cost proposal.

TASK 1. PROJECT COORDINATION

Task 1a. Scope Development

Director of RCAA's Natural Resources Services Division and wetland ecologist Craig Benson will consult with Coast Seafood, the State Coastal Commission, the Harbor District (permit holder), and SCC (landowner) to clearly understand their expectations for the habitat mitigation measures. The intent of this consultation is to ensure that there are no "surprises" for the client and that RCAA's proposed spartina removal methods, monitoring, reporting, and schedule will meet the requirements of the Coastal Commission, Trustee permit holder, and landowner.

Assumption: This task will require review, comment, and revision of this Scope of Work

Deliverable: Revised Final Work Plan

Task 1b. Contracting and Invoicing

RCAA's Executive Director will sign a contract with Coast Seafood Company and NRS Division will prepare invoices at intervals set forth in that contract.

Assumption: Coast Seafood will develop contract based on this Scope of Work and Budget Proposal

Deliverable: Fully-executed Contract

Task 1c. Meetings

RCAA will attend one on-site meeting with Coast Seafood and the SCC at the Bracut Marsh site.

Deliverable: Meeting notes

TASK 2. PERMIT COMPLIANCE

RCAA will facilitate a discussion with the project stakeholder as to the appropriate permitting method for this effort. Since Bracut Marsh was an approved, permitted habitat construction project back in the 1980's, the spartina eradication work may be considered maintenance of that permitted work. Alternatively, this effort may fall under the permit protocol defined in the *Humboldt Bay Regional Spartina Eradication Plan* and *Programmatic EIR* for which the Harbor District is the permit holder. There may also be specific conditions related to the Coastal Commission approval of this effort as compensatory mitigation for the Coast Seafood Hatchery.

Task 2a. Implement Site Assessment Protocol

RCAA's Planning Specialist Amy Eberwein will conduct a site assessment utilizing the protocol described in the *Humboldt Bay Regional Spartina Eradication Plan*. This site assessment will evaluate and map the extent of spartina in the Bracut Marsh, recommend spartina treatment methods allowed in the Regional Plan, and recommend best management practices to minimize the impact of spartina treatment on water quality and species which may be present on site.

Task 2b. Provide Work Plan to Permit Holder

RCAA will develop a site specific work plan based on the site assessment and provide this to the permit holder.

Assumption: This project will be covered under programmatic permits of the Regional Spartina Eradication Project.

Deliverable: Assessment Field Notes and Work Plan

TASK 3. SPARTINA TREATMENT

Sub-tasks 3a through 3e include five sequential years of annual spartina treatment in the Bracut Marsh. The treatment area and methods will be delineated and described in the Work Plan developed in Task 2b above. Methods will likely include a combination of methods such as top-mowing, brushcutting (grind method), and shovel excavation for primary treatment and re-sprouts depending on site variation and particularly soil rock fragment. Flaming with torches may also be applied to seedlings. Treatment will occur between late winter and early summer when spartina is visible and when flowering before seed dispersal.

The invasive spartina removal effort will be greatest in Year 1 and reduce immediately in Year 2-5 as invasive weed re-sprout declines and the seed bank is exhausted. Care will be taken to preserve native plants in place during spartina treatment.

Task 3a. Year 1 Spartina Treatment

RCAA will treat 100% of the invasive spartina within the delineated habitat productivity enhancement area in Year 1 using a combination of the aforementioned methods appropriate to the life stage and density of spartina.

Task 3b. Year 2 Spartina Treatment

RCAA will perform follow-up treatment of spartina plants that resprout, as well as germinating seedlings taking advantage of cleared ground.

Task 3c. Year 3 Spartina Treatment

RCAA will perform follow-up treatment of invasive spartina that resprouts or germinates in Year 3.

Task 3d. Year 4 Spartina Treatment

RCAA will perform follow-up treatment of invasive spartina that resprouts or germinates in Year 4.

Task 3e. Year 5 Spartina Treatment

RCAA will perform follow-up treatment of invasive spartina that resprouts or germinates in Year 5.

Assumption: Spartina will be treated in the inboard portion of the Bracut Marsh which the substrate is edaphic (soil-based) and will NOT be treated on the outboard side of the rip-rap dike.

Assumption: As long as there are spartina seed sources on the outboard side of the Bracut dikes and in adjacent marshes 90-95%, but NOT 100%, eradication of spartina will be possible.

TASK 4. MONITORING AND REPORTING

RCAA proposes to monitor spartina removal, control, and eradication as a proxy for increase in net primary productivity within the site. The final success criteria is 95% eradication of spartina in the interior half acre of Bracut Marsh. Monitoring methods will include treatment work records, photo-points, estimation of cover density, and annual mapping of the spartina infestation.

Work records – will confirm that the work was done including dates worked, crew hours, and field notes on treatment.

Photo-points - 5 representative vantage points within the site will be selected and marked with T-posts. Photos will be taken in Year 0 before spartina treatment begins and each subsequent year in the Fall of each year.

Percent Cover/Density – Before treatment areas with spartina will be assigned low, medium, or high density classes by ocular estimation by a trained wetland ecologist or botanist. Qualitative descriptions of cover and density will be provided in each year.

Mapping – the spartina infestation will be mapped onto a DEM using GIS software in Year 0 and tracked each year.

Task 4a. Annual Monitoring

The goal of this project is 95% eradication of spartina in the interior Bracut Marsh as a proxy for

RCAA's wetland ecologist will monitor the site in Year 0 and each year for five years in the Fall employing the methods described above. A written monitoring report including an updated GIS map and select photographs will be written after annual monitoring and provided to the permit holder and Trust Resource Agency by Dec 31 of each year.

Annual performance monitoring should demonstrate an annual reduction in spartina on the site and a positive trend towards meeting the final success criteria on 95% spartina reduction.

Deliverable: Four Annual Monitoring Reports

Task 4b. Final Report and Agency Site Tour

In Year 5 RCAA will produce a final report which aggregates the prior annual reports including the results of final Year 5 monitoring, into a comprehensive project report. It is anticipated that RCAA will lead the Resource Trust Agency (Coastal Commission), permit holder (Harbor District), landowner (SCC), and Coast Seafood representative on a final walk thorough of the site.

Deliverable: Final Report

SCHEDULE

We anticipate the commencement of work within one month from receiving a fully-executed contract and notice to proceed via e-mail or U.S. mail from Coast Seafood Company. RCAA would expect to complete Task 1 and Task 2 within one month of receiving a contract and to initiate Year 1 treatment (Task 3a) in 2016. All the tasks outlined in this scope would be completed by December 2021.

A task by task fee estimate for completing this scope of work is attached for your perusal. If you have any questions regarding this scope and budget, do not hesitate to contact me at (707) 269-2065.

Very truly yours,
Redwood Community Action Agency



Craig Benson
Watershed Program Manager