United States Department of the Interior

NATIONAL PARK SERVICE
Point Reyes National Seashore
Point Reyes, California 94956

IN REPLY REFER TO:

L7617

MAR 17 2015

Mr. Mark Delaplaine
Federal Consistency Program
California Coastal Commission
45 Fremont Street, Suites 2000
San Francisco, CA 94105

Subject : Coastal Consistency Determination and Project Description for the Drakes Estero Restoration Project

Dear Mr. Delaplaine:

In accordance with the Coastal Zone Management Act of 1972 and its' implementing regulations 15 CFR 930, the National Park Service (NPS) is submitting this Coastal Consistency Determination for the Drakes Estero Restoration Project (Project). The NPS has evaluated the Project and has found it consistent to the maximum extent practicable with the California Coastal Act of 1976 as amended.

The enclosed Project submittal package includes the following:

- Coastal Consistency Determination and Project Description
- Appendix A – Eelgrass and Debris Assessment and Assumptions
- Appendix B – Oyster Shell Debris Treatment and Response
- Appendix C – Drakes Estero Long-term Monitoring Program
- Appendix D – Operational Guidelines

The submittal package also will include the Title I Preliminary Engineering Report, Holladay Engineering Company, March 2015. This report will be submitted under separate cover.

Please contact park Management Assistant Brannon Ketcham at 415-464-5192 or brannon_ketcham@nps.gov if you have any questions or require further information.

Sincerely,

Cicely A. Muldoon
Superintendent

Cc: Cassidy Teufel
Enclosures

NATIONAL PARK SERVICE
POINT REYES NATIONAL SEASHORE

MARIN COUNTY
CALIFORNIA

COASTAL CONSISTENCY DETERMINATION
DRAKES ESTERO RESTORATION PROJECT

I. AUTHORITY

The National Park Service (NPS) is submitting this Coastal Consistency Determination in compliance with 15 CFR Section 930.34 *et seq* of the National Oceanic and Atmospheric Administration (NOAA) Federal Consistency Regulations (Title 15 Code of Federal Regulations Part 930).

II. DETERMINATION

Point Reyes National Seashore is located on coastal California, 30 miles north of the Golden Gate (Figure 1). Point Reyes National Seashore administers more than 95,000 acres of National Park Service (NPS) land, water and subtidal land. The boundary of Point Reyes includes estuarine and marine habitat extending ¼ mile offshore. Drakes Estero and the lands surrounding Drakes Estero are federal lands subject to review for consistency with the California Coastal Management Program (CCMP).

The NPS has evaluated the Drakes Estero Restoration Project activities and has found it consistent to the maximum extent practicable with the California Coastal Act of 1976 as amended. The Project Description and impacts documented as part of this application provide the basis for this determination.

Figure 1: Project Vicinity Map (Map Source: Google Earth)

III. PROJECT DESCRIPTION

The Drakes Estero Restoration Project is intended to remove all aquaculture infrastructure and marine debris and to restore conditions supporting natural ecological and hydrologic process within Drakes Estero. The restoration actions include removal of wooden racks, debris, and other infrastructure, as well as development and implementation of long-term monitoring programs to document the ecological response and transition of Drakes Estero to the cessation of aquaculture activities and restoration. The project involves the following activities:

A. Restoration Operations and Activities
    a. Temporary Offload and Transfer Site Development
    b. Anchoring
    c. Debris Hauling
    d. Interim Buoys for Removed Racks
    e. Channel Markers for Project Operations
B. Oyster Rack Removal
    a. Rack Removal Method
    b. Collapsed Rack Removal
    c. Environmental Considerations for Hydraulic Operations
    d. Inadvertent Breakage
    e. Rack Removal Summary
C. Marine Debris/Non-Native Shellfish Removal
    a. Aquaculture Debris Removal (Oyster Strings, Tubes, and Bags)
    b. In-Situ Treatment of Accumulated Shell
    c. Removal of Oyster Mats
    d. Removal of Established Anchors and Lines
    e. Removal of Uncontained Manila Clam
D. Drakes Estero Stewardship Program
E. Drakes Estero Monitoring Program

In addition to the Project Description, the Project submittals also include the following:

- Appendix A – Eelgrass and Debris Assessment and Assumptions
- Appendix B – Oyster Shell Debris Treatment and Response
- Appendix C – Drakes Estero Long-term Monitoring Program
- Appendix D – Operational Guidelines
- Title I Preliminary Engineering Report, Holladay Engineering Company, March 2015 (submitted under separate cover)

Drakes Estero Restoration Project Goals, Environmental Considerations and Constraints

The primary planning approach for this project is to maximize removal of aquaculture infrastructure and debris while minimizing impacts to existing eelgrass beds. The NPS intends to remove or treat as much unnatural hard structure as feasible to improve potential for eelgrass to expand, and to minimize potential habitat for the non-native invasive tunicate *Didemnum vexillum*.

The NPS has observed that while eelgrass is present around the active racks, in many cases there is little to no eelgrass present beneath the racks. The factors influencing this include shading from the rack and the former hanging culture, as well as debris accumulation forming an oyster shell cap over the bed surface. The project will include long-term monitoring to evaluate multiple response, restoration, and research questions regarding removal of aquaculture infrastructure and debris from Drakes Estero.

Preliminary Assumptions

The NPS has collected and analyzed aerial imagery and underwater video of more than 70 racks within Drakes Estero to identify planning assumptions for this project. The more detailed description of how estimates were derived is included as Appendix A. The Project Area is represented by the offshore and onshore areas of the former commercial oyster operation with Drakes Estero. There are a number of specific areas within the restoration project area where the NPS plans to implement removal and restoration activities (Figure 2). Barge and boat traffic associated with the demolition and restoration activities will follow established vessel transit corridors.

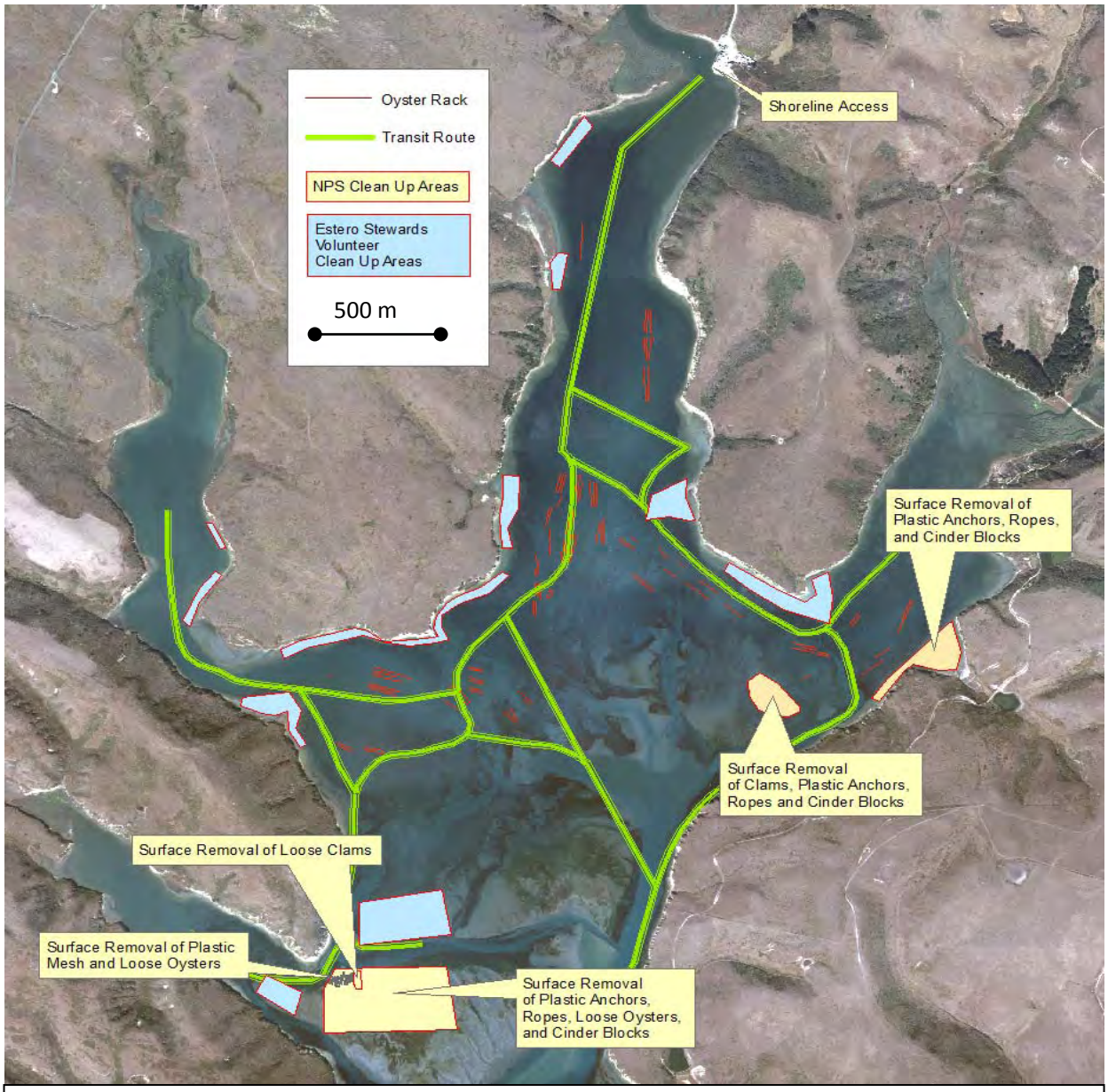


Figure 2: Project Treatment Areas, and primary vessel transit routes within Drakes Estero

The 95 oyster racks comprise approximately 7.07 acres of area (308,000 square feet), and if lined up end to end are more than 5 miles long. In the long-term, the project will enhance and restore conditions within the entirety of that 7.07 acres through the removal of infrastructure and restoration of more natural conditions. The NPS estimates that approximately 2,234 vertical bent structures are installed in the bed of the estero and hold the racks in place. The Drakes Estero Restoration Project will result in removal of between 200,000 and 250,000 total board feet (approximately 477 tons) of lumber from Drakes Estero. It is estimated that approximately 40% of the posts and 41% of the length of bottom cross-member (deadman) are adjacent to and could affect existing eelgrass habitat. Table 1, below identifies the overall project area footprint and impact area within areas where eelgrass is documented.

Table 1. Summary of Cumulative and eelgrass impact areas.

Impact area for posts and deadmen are estimated based on general observations of impact area from the method pull test. The estimate for stingers is based on their dimensional footprint (approx. 4" wide by length of stringer). Deadmen are not included for Racks 4A, 8A, 8B and 8C. Aquaculture debris is included within the Moderate/Heavy debris area calculation, so it is not double counted in the total. The debris experiment area is subtracted from the Shell debris area. All values are estimated from underwater video footage from 71 of the 95 racks. Level of error for eelgrass cover, stringers on the estero floor, shell debris, and plastic/wire is unknown, but is likely less than 25%.

	Cumulative Impact Area		Eelgrass Impact Area	
Component	**Sq Ft**	**Acres**	**Sq Ft**	**Acres**
Within Rack Footprint				
Posts (assume 1.3 SF/post)	8,713	0.20	3,572	0.08
Bottom Cross-member (assume 1 SF/LF)	30,072	0.69	12,726	0.29
Stringers on Estero Floor (total area of boards covering bed of Estero)	11,928	0.27	6,232	0.14
Moderate/Heavy Aquaculture and Shell Debris	103,830	2.38	0	0.00
Aquaculture Debris – Bag, Tube and String Cleanup*	41,818	0.96	0	0.00
Shell Debris Treatment Experiment*	2,880	0.07	0	0.00
Total Impact Area within Rack Footprint	**154,542**	**3.61**	**22,530**	**0.52**
Total Project Area within Rack Footprint	**308,016**	**7.07**	**126,287**	**2.90**
Outside Rack Footprint				
Dock and Anchors[#]	3,200	0.07	1,600	0.04
Oyster Mat Removal	16,988	0.39	0	0.00
Manila Clam Treatment (Bed 17)	21,344	0.49	0	0.00
TOTAL IMPACT AREA	**196,075**	**4.50**	**24,130**	**0.55**
TOTAL PROJECT AREA	**349,549**	**8.02**	**127,887**	**2.94**

*areas within Total Moderate/Heavy Shell Debris Area

[#]see text for calculation of eelgrass impact

The other primary component of the project is removal of marine debris. It is estimated that approximately 2.4 acres of the 7.07 acres representing the area beneath the racks is covered in moderate /heavy shell debris. These moderate/heavy accumulations of shell and aquaculture debris are assumed to impede or prevent potential for eelgrass recovery without intervention. Within that 2.4 acre area, the NPS has documented approximately one acre where the debris includes accumulations of aquaculture debris such as tubes, strings and bags.

The NPS has considered multiple approaches to treatment of accumulated moderate/heavy aquaculture debris and shell beneath the racks. The primary approach will be to remove all accumulated aquaculture debris (approximately 1 acre) using an excavator with a dredge bucket. This approach will target removal of aquaculture debris from the bottom, and will result in removal of some shell within those areas. In the remaining moderate/heavy debris areas beneath the racks, where the shell accumulation has formed a cap over the natural substrate, the NPS has proposed in-situ treatment of shell caps. Staff consulted with local eelgrass specialists to inform the restoration approach for these areas. The proposed actions reflect recommendations to minimize alteration of bed elevations and to break up the accumulated shell cap in favor of more space for natural sediments to infiltrate (K. Boyer, *pers. comm*). These efforts are not intended to spread or change the footprint of the accumulated shell. A summary of this approach is included in the Marine Debris/Non-Native Shellfish Removal section.

The NPS has identified additional actions for areas outside of the current rack footprints. These other actions include the removal of plastic mesh mats and other infrastructure from more than 0.4 acres of sand bar, and treatment actions to remove Manila clam from a 0.5 acre area near bed 17. Finally, the NPS has also identified additional areas where plastic mesh mats and other infrastructure were installed on the sand bars (outside of the rack areas), affecting an additional 0.4 acres. These actions are described further in the Marine Debris/Non-Native Shellfish Removal section.

Duration of Work

This project requires a high level of coordinated effort. Since the project is in the marine environment, tidal and weather elements will have a significant impact on the ability of a contractor to progress the demolition. In addition to potential tidal impacts to the project schedule (low tides in middle of the day), the late summer months typically experience higher winds. A 16% estimated likelihood of winds between 10-20 mph has been used. Winds at this level will curtail or prevent demolition activities on the Estero. The demolition activities are projected to start on July 1st. It is anticipated that the work associated with all demolition activities will take approximately 109 work days. Because of wind and tide factors, it is anticipated that the work would be completed over approximately 146 work days See Table 2.

Table 2 – Work Day Evaluation

Month	Work Days	Tidal Delay Days	Wind Delay Days	Contract Work Days
July	23	6	4	33
August	21	2	3	26
September	22		4	26
October	22	6	4	32
November	21	5	3	29
Recommended Contract Work Days				146

For contracting purposes it is assumed that the project will allow approximately 204 calendar days for the work. The contract window for the project is anticipated from July 1, 2015 to January 20, 2016.

Restoration Operations and Activities

There are a number of temporary operational actions and activities necessary to support restoration of Drakes Estero. In addition to temporary onshore improvements for unloading and transfer of debris recovered from the Estero, there are a number of offshore operational activities that will be necessary during the active project period.

Temporary Onshore Transfer Facility

The project staging area can be as much as 8 feet above the water level at low tide. Even at high tide, the slope of the shore does not allow for direct access to floating vessels from the shore. The extensive volume of debris that has to be transported out of the estero through the staging area requires development of a temporary onshore transfer facility. Temporary site improvements are necessary to allow for the efficient transfer of debris containers from the demolition vessels onto the shore. The extent of onshore development required for the project is dependent on the type and volume of materials that will be removed from Drakes Estero. All constructed improvements will be removed at the completion of the project.

A temporary floating dock would be constructed with a bulkhead on the shore in order to secure multiple barges in series to the shore. This floating dock will facilitate docking, unloading and loading of the debris boxes from offshore barges within deeper water areas allowing operations at a broader range of tides. Minor grading of the Estero floor or banks may be required to increase the range of the dock and to create a level surface for the barges to settle into the mud of the Estero at low tide. The concept drawing for a 20 ft wide by 150 ft long temoporary floating dock is included as Figure 14 in the Title I report (Holladay Engineering 2015). The temporary floating dock of that length would likely require temporary anchors at approximately 20 foot intervals to ensure the dock remains in a stable algnment. Surveys of the bottom bathymetry and eelgrass presence within the general area of the dock will be conducted to determine final approach and impacts associated with this temporary facility. A wheeled forklift will transport debris boxes along the floating dock to the onshore processing area. For heavier debris, an excavator may be required for transport of boxes for the length of the dock.

The primary advantages of this approach are:

1. Improved access to vessels operating in the estero;
2. Managed vessel approach and unloading, thereby reducing impact to adjacent eelgrass
3. Improved flexibility for the contractor operations;
4. Improved means to refuel vessels and equipment;
5. Easy unloading of barges and removal of barges;
6. Minimizes potential needs for excavation in the estero.

The temporary dock will result in temporary impacts through shading and limited settling at low tide over a 3,000 square foot area. Placement of temporary dock anchors will result in temporary impacts to an additional 200 square feet. The NPS has documented intermittent eelgrass beds in some areas within the footprint of the floating dock. As part of the site survey, the actual area of eelgrass can be

determined but based on site visits is currently estimated at 50% of the total dock impact area. This temporary floating dock approach generally maintains existing shoreline topography and will minimize followup treatment in association with the temporary impacts.

Once rack and marine debris is transported to the onshore area, all other work will be conducted outside of the Mean High Water level. Debris will be sorted and transferred from the smaller containers used over water to larger containers for transport and delivery to approved disposal facilities.

Once offshore demolition activities are complete, the contractor will remove the temporary onshore transfer facility infrastructure and regrade the site to generally match current conditions.

Anchoring

Vessels containing debris containers and/or excavators are anticipated to be larger than the floating dock used in the rack removal method test conducted February 17-18. A more robust anchoring system will be necessary for these vessels than a vertical pole used for positioning and anchoring in the method test.

The rack and marine debris removal activities will require the operation and use of equipment from multiple barges (see below for barge descriptions). Operational barges supporting operations of the excavators and other removal equipment will require a flexible and stable anchoring system. They will need to move along the line of the racks during demolition and will also be best anchored in the water overnight. Debris transport barges will be generally mobile and may be tied off to operational barges. It is anticipated that the larger barges and equipment will be more susceptible to wind, wave and tide effects.

General anchoring of the demolition vessels will be conducted in a manner so as not to impact eelgrass by anchoring within the boundaries of oyster racks and in areas without eelgrass. Anchoring of barges overnight will be done in areas without eelgrass. In areas of established eelgrass, anchoring will conducted in a manner to minimize disturbance of established eelgrass (i.e. limiting mooring lines, vertical anchoring, and no anchor chains allowed to “sweep” the bottom.) Anchoring is proposed that will allow the demolition vessel to use the anchors to pull the vessel forward and position it in front of oyster rack bents.

Debris Hauling

Removed material will be lifted directly into a debris container on a debris transport barge. The material will not be allowed to be drug onto barge decks or across container edges in order to prevent the loss of *Didemnum* from the debris material back into the estero. Debris containers, when full, will be taken by self-propelled barges or towed by support boats back to the staging area along identified vessel transit routes. Debris transports will tie off along the onshore floating dock. The configuration of the dock will allow for 2-3 transports to be tied off at one time. Debris boxes will be lifted from the barges transferred to shore using a wheeled lift and transferred onshore. Empty containers would be loaded back onto the barges for transit back to the work areas. Fouling organisms will also be disposed of on shore and not allowed to wash back into the estero.

Interim Buoys for Removed Racks

The oyster rack perimeter will be marked with buoys (anchored inside the oyster rack footprint) during the demolition process. This will allow for easy identification of rack perimeter where moderate and heavy shell debris removal or treatment is planned, and will allow for easy location of the treatment area for final inspection. All buoys will be removed at the completion of the project.

Channel Markers for Project Operations

Channel markers for the main channel running north to south in Schooner Bay remain in place, and will remain for the duration of operations to accommodate safe and efficient transport of materials. As noted above, contractors will also install temporary buoys or PVC pipe to mark the footprint of racks until inspections for completion are complete. NPS will evaluate transit routes and install or remove markers as necessary during the project. Following completion of the project, NPS will remove markers from Drakes Estero consistent with Wilderness status.

Oyster Rack Removal

The 95 oyster racks comprise approximately 7.07 acres of area (308,000 square feet), and if lined up end to end are more than 5 miles long. Materials used to construct the racks typically consisted of 2 in. x 4 in. and/or 2 in. x 6 in. milled lumber (see Figure 3 and Figure 4 for typical condition). Some oyster racks appear to have been constructed using pressure treated lumber. DBOC was not permitted to construct or add new lumber to the oyster racks for the last ten years. Therefore, it is assumed that all lumber in the Estero has been in-place for at least 10 years.

The racks are comprised of vertical bent structures sunk into the mud, and horizontal stringers that were used to hang oyster strings. Vertical bent structures consist of three (3) vertical 2x6 inch posts affixed and stabilized by a 14-foot long 2x6 inch horizontal cross-member. Our observations indicate that in some cases, the cross-member is buried below the mud line, but in other cases it is at or above the mud line. The three vertical spars stick down into the mud approximately 5 feet. We have identified four racks representing approximately 80 bents where the posts are 4-inch round poles, which do not appear to have the bottom cross-member.

The top of the bent structure is held together by a 2-inch by 4-inch and 2- inch by 6-inch cap board. Stringers are installed over the tops of the bents, spanning the bents horizontally to hang the strings of oysters. Six stringer boards spaced equally across the bents, make up the top of the rack for the entire length of the rack. The approximate width of the racks is 12 feet. The stringers are generally 2-inch by 4-inch boards. Individual stringer boards are installed with overlap and secured generally by a high volume of nails. It is estimated that there is a 20-25 percent overlap for the stringer boards. Field tests indicate that the stringer boards are difficult to pry apart and will be most efficiently removed using hydraulic shears or scissors.

The oyster racks are in various conditions ranging from in-tact to extremely dilapidated. Based on submittals from Drakes Bay Oyster Company up to 54 racks were actively used through September and October 2014. A total of 41 racks were classified as unused by DBOC at that time and likely reflect more degraded conditions. The conditions of these abandoned racks include an assortment of broken and missing stringers, and broken and partially intact bents / posts.

Table 3 presents an inventory of the oyster racks based on reporting from DBOC that has been corroborated by NPS using visual inspections and aerial photographs.

Table 3 – Oyster Rack Inventory	
Racks	95 UNITS
In-tact Bents	2106 EA
Collapsed Bents	128 EA
Posts	6702 EA
Stringers	154,008 LF
Top Cross-members	21,450 LF
Bottom Cross-member (mud-line)	31,276 LF

Figure 3: Typical Oyster Rack in Drakes Estero (Photo Source: www.sfweekly.com)

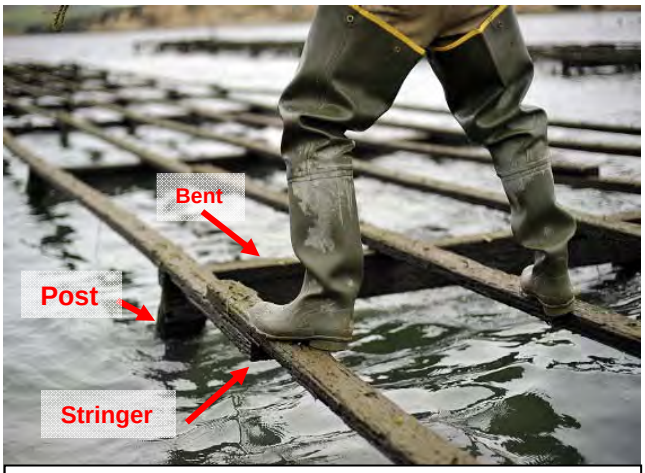


Figure 4: Typical Oyster Rack in Drakes Estero (Photo Source: www.sfweekly.com)

Rack Removal Method

In mid-February contractors tested methods to determine the preferred method for rack removal. The contractor tested a winch and pully system for removal of posts and stringers. The rack removal investigation demonstrated that the force applied by a 2,000 lb winch was not consistent in its effectiveness in removing the oyster rack posts and consumed more time than was expected. In addition, there are safety concerns for operating personnel associated with the necessarily high cable tension observed in the rack removal investigation. The February pull-test also showed that removal of the rack stringers using crowbars was extremely difficult and time consuming.

Underwater monitoring and video did show that when a single post was pulled, disturbance to the estero floor was limited to a very small area and the hole from the pulled post immediately filled in with sediment level to the surrounding sea floor. Increases in turbidity as a result of the pull returned back to pre-pull conditions in one to three minutes.

The rack removal investigation applied a removal force to the oyster rack posts of 2,000 lbs or less. It is assumed that increasing the pull-out tension will decrease the duration of time for each post removal. However, there is a limit to the amount of force that should be applied to the posts. The oyster rack posts are assumed to be No. 2 douglas fir-larch 2”x6” sawn lumber. According to the American Wood Council, the tension capacity of a new No. 2 douglas fir-larch 2”x6” is 6,160 lbs. in tension. The oyster rack posts have been in the water for a minimum of 10 years. The removed 2”x6” posts have shown degradation in the section that was exposed to the tidal fluctuations. Therefore, the tensional strength of the oyster racks is assumed to be degraded. Assuming a degradation of 30%, the oyster rack posts should not be removed with a tension force greater than

4,312 lbs. The oyster rack posts may break at an unacceptable rate if tensions greater than 4,300 lbs are applied to the posts.

Based on the results of these tests and constraints to complete the project within the time schedule as stipulated in the Basis of Design, the use of hydraulic equipment is planned for rack removal. A hydraulic excavator secured to a barge will provide the most flexibility for removal of stringers and bent cross-members.

The mini-excavator, a small tracked excavator, is proposed as the primary equipment for rack removal. Figure 5 shows a typical mini-excavator. Generally, mini-excavators have a lifting capability of over 4,000 lbs and less than 10,000 lbs which is consistent with the assumed project requirements. The operating weight of the mini-excavator, from 3 to 5.5 tons is considered another imporant advantage. The Estero is a shallow water body. Lighter equipment has the advantage of increasing the duration of operation within the Estero through tidal fluctuations. The machine features independent boom swing with interchangeable appurtenances depending upon the application of the machine.

Figure 5: Typical Mini-Excavator
Photo: www.cat.com

The mini-excavator will likely operate with a grapple-claw for the grabbing of debris material and depositing it into a debris container on the same barge or a hydraulic scissor to cut stringers and other boards as necessary for safe and easy removal from the site. The hydraulic scissor may be used above and below water, and is intended to cut the lumber and will not produce any saw dust that could be released into the estero. The use of the mini-excavator will also allow for a more consistent force to be applied on each post and is expected to reduce potential for post breakage. The mini-excavator will also increase the flexibility of conducting demolition activities and will be able to operate from various work platform rack orientations.

Collapsed Rack Removal

In addition to the 128 collapsed bents, the NPS has identified that approximately 30% of the in-tact bents within Drakes Estero have stringers lying on the bed of the estero, generally within the footprint of the rack. Our calculations estimate that there is a total of 11,925 SF of stingers Most of these highly dilapidated racks have been abandoned for a long period, and eelgrass is present within the footprint of the rack.

The removal of collapsed racks present a slightly more complex situation. While the same mini-excavator set up will still be effective at deconstructing collapsed racks, it may take more time to remove these racks. In many cases the stringer units are still intact but lying on the bottom, and would need to be cut prior to removal to minimize bottom impacts. The operation of the hydraulic scissor to cut large pieces of collapsed rack into pieces for removal with the grapple claw provids the most effective and efficient means of removing the debris from the bottom of the estero and minimizing impact to surrounding eelgrass.

Environmental Considerations for Hydraulic Operations

The use of hydraulic equipment increases the presence of petroleum products on the estero during demolition activities. However, the most significant environment spill potential is associated with a broken hydraulic line. Therefore, it is recommended that food grade vegetable oil be used as the hydraulic fluid in all hydraulic equipment used on the estero. In addition, spill response plans and containment protocols in the event of a fuel or oil spill are typical requirements of federal contracts.

Inadvertent Breakage of Posts

In cases where posts break on multiple attempts to remove them, the contractor will be directed to to cut broken posts at the mudline. NPS will monitor post breakage during the demolition activities. The contractor will be required to modify the means and method of demolition if the breakage of posts during removal is too frequent. The project is assuming a breakage of 5%. This may leave up to 335 (6702 posts x .05) buried post segments in the estero floor; approximately 20 square feet.

Rack Removal Summary

The rack removal is the most extensive restoration project task. The project summary table (Table 1) identifies the general impact footprint to the subtidal land and to eelgrass within the footprint of the racks.

Eelgrass is limited to absent within the footprint of the 54 racks that were actively used through the fall of 2014. For racks that have long been collapsed (e.g. classified as in poor condition by DBOC in 2010), it is typical that there is eelgrass growing within the footprint of the rack. In many cases, just outside the rack footprint, eelgrass coverage is moderate to dense. Similarly, with respect to debris accumulation, we have found that in areas of moderate to heavy accumulation, eelgrass is not present, but in areas of low debris accumulation, we have observed some eelgrass growing between debris and/or shell.

Our calculations for eelgrass are based on the following information. For 71 racks, NPS staff reviewed and identified the number of bents where eelgrass was present around the base of the posts, over buried cross-members, or outside the footprint but within the 1-foot overlap area of the buried cross-member. Based on our assessment, we estimate that approximately 41 percent (2,719 of 6,702) vertical posts are located in areas where eelgrass is present. As presented in Table 1, removal of these posts will affect approximately 8,713 SF (0.20 acres) of subtidal land, and has the potential to affect approximately 3,572 SF (0.08 acres) of eelgrass.

It is estimated that there are 839 cross-members that are present in areas where eelgrass is present, and would likely result in impacts to eelgrass when the cross-member is pulled out with the bent. In the case where the cross-member is exposed, we have not assumed impacts to eelgrass from the removal of the cross-member. As presented in Table 1, removal of these bottom-cross-members will will affect approximately 30,072 SF (0.69 acres) of subtidal land, and has the potential to affect approximately 12,726 SF (0.29 acres) acres of eelgrass.

As noted, approximately 30% of the in-tact racks have collapsed stringer sections associated with them. The total estimated area of the lumber associated with these collapsed stringers is 11,928 SF (0.27 acres) with approximately 6,232 SF (0.14 acres) of collapsed stringers planned for removal within established eelgrass habitat.

Overall, removal 7.07 acres of oyster racks from Drakes Estero will affect approximately 51,000 SF (1.17 acres) of the subtidal land and 22,530 SF (0.51 acres) of eelgrass present within the footprint of the racks. Additional information related to removal/treatment of shell accumulation areas is described below.

Marine Debris/Non-Native Shellfish Removal

The NPS has documented extensive accumulation of shells, strings and tubes from aquaculture operations at various locations below oyster racks within Drakes Estero. The density of the accumulation likely affects, and in high densities, appears to preclude eelgrass growth. The proposed approach to treatment of debris accumulation is to remove all aquaculture debris, treat accumulated shell within existing rack footprints, and initiate a long-term monitoring effort to determine effectiveness of in-situ treatment. Additionally, assessment of growing areas on sand bars in the southern portion of Drakes Estero indicates that there remain extensive amounts of infrastructure and shellfish growing debris which will be removed as part of this project.

A total of 2.4 acres of area beneath the oyster racks have moderate to heavy accumulation of oyster shell and aquaculture debris. Within that 2.4 acre area, there are a number of locations totaling 1 acre where aquaculture debris, including French tubes, oyster strings and mesh bags full of oysters is present. This accumulation of this aquaculture debris is inconsistent with the long-term wilderness and restoration values of the Estero, and may provide unnatural substrate impeding growth of eelgrass or providing a hard-structure foothold to the growth of other non-native fouling organisms such as *Didemnum vexillum*.

Table 4 presents the findings of those investigations.

Table 4 – Aquaculture and Oyster Shell Debris Areas with proposed treatment

	Area (Square Feet)
Oyster Racks with heavy debris	73,819
Oyster Racks with moderate debris	30,011

The NPS evaluated the feasibility of full scale vacuum or hydraulic suction and removal of aquaculture debris and heavy/moderate density shell accumulated under approximately 2.4 acres of racks (Sections 5.2.1 and 5.2.2 of Title I Report). The equipment necessary for such an operation would include a specialized self-propelled barge is fitted with an adjustable suction line and typically a 24 inch horizontal auger head. The auger combines the debris on the estero flow with water to form a slurry that will be hydraulically pumped back to a dewatering tank on a separate barge. All materials removed from the estero, mud, shell and water, would be captured in frac tanks and transported to shore. Handling of the more than 24,000 cubic yards of material and water from the estero would require extensive dewatering ponds and separation containment areas to dry mud and shell for future disposal. Based on this evaluation, the NPS determined that the scale of the operation, including equipment, space for materials handling and management, and disposal of materials is not feasible given site access limitations, site space constraints and the shallow nature and tidal dynamics of the Estero.

Further, based on consultation with local eelgrass research experts, it is recommended that the bed elevation be maintained near that of adjacent eelgrass beds and that in-situ treatment that breaks the shell cap with a fork type implement is predicted to provide potential habitat for eelgrass to move in to the heavy and moderate shell accumulation areas.

Based on these determinations, the NPS has identified the following approach to address concerns related to the aquaculture debris and to treat the accumulated shell. Three treatment approaches are identified for the 2.4 acre area of moderate/heavy shell and aquaculture debris accumulation. The project will proceed with the following activities:

- Remove all accumulated aquaculture debris, including tubes, strings and plastic or mesh bags used in shellstock culture operations from approximately 1 acre of heavy/moderate shell accumulation areas.
- Initiate in-situ treatment of heavy/moderate shell accumulation areas covering 2.30 acres (100,950 SF). See method description below
- Install 60 plots (Each covering 144 sq ft for a total of 8640 sq ft = 0.2 acre to test eelgrass infill within full removal, in-situ treatment and no treatment plots (see Appendix B).

Aquaculture Debris Removal(Oyster Strings, Tubes and Bags)

An excavator using a clamshell or equivalent dredge bucket type will access and remove accumulated aquaculture debris (bags, strings, and tubes) from the bottom surface (See Figure 6). Operators would be instructed to minimize disturbance to the bed and not digging deep into native sediment. Debris will be placed directly into debris boxes on a barge for transport to shore and proper disposal. This method will also result in collection of some additional free oyster shell as part of the removal.

Figure 6: Dredge Bucket (Photo:http://www.gradall.com)

In-situ Treatmentof Shell Debris

In-situ treatments will be conducted using an excavator with ripping forks to break the established shell cap thereby allowing spaces for eelgrass to establish within the footprint of the racks. This will entail use of a larger excavator on a barge. This excavator will be capable of using a dredge bucket to pick up larger tubes, bags, and strings, as well as using a fork or ripper implement to break the shell cap as part of the insitu treatment. The NPS and contractors are currently evaluating the extent to which the in-situ treatment may be employed. This in-situ treatment will be conducted over 2.32 acres including approximately 1 acre where aquaculture debris has been removed, as well as remaining 1.32 acres of heavy/moderate shell accumulation areas.

Development of treatment plots will include installation of 20 full removal plots and 20 in-situ treatment plots. Full removal will be conducted on a small scale to monitor response to such treatment using a compressed air diver-directed suction operation. The dredge bucket would be employed to establish the full removal plots as well.

No treatment is anticipated for areas with minor shell accumulation.

There will be short-term localized effects to turbidity as a result of materials removal from the Estero bottomlands. This impact is short-term in duration, and will result in improved condition through removal of aquaculture debris and in-situ treatment of remaining accumulated shell that will enhance the potential for eelgrass to become established or spread, and reduce scale of shell caps within the estero. While the potential hardstructure for *Didemnum* to attach to remains, monitoring will be conducted to determine if a more aggressive treatment approach to shell accumulation is necessary in the longer term.

Removal of Oyster Mats

It appears that between 2009 and 2014 DBOC rolled out plastic mesh mats that were used to grow oysters outside of bags or containment (Figure 7).

Figure 7: Plastic Mesh Fabric Oyster Mat

The NPS has documented through review of recent aerial photos the presence of approximately 15 sections of this 12 foot wide mat, ranging in length from 50 to 100 feet on the western portions of the sandbar near bed 17, but not in bed 17 (Figure 8). The total area covered by these mats is approximately 16,900 SF (0.39 acres). These mats are covered by 2-6 inches of sand and a large number of uncontained live large pacific oysters (see left portion of Figure 7).

Based on field tests, it is likely that with limited water depth (approximately 6-12”), these mats could be rolled by hand with the oysters mostly contained. The rolled mats would have to be hoisted out of the water and onto a barge. The width of the mesh would allow most sand to sluice through the porous fabric. Any additional areas where mats are identified will be treated in the same manner.

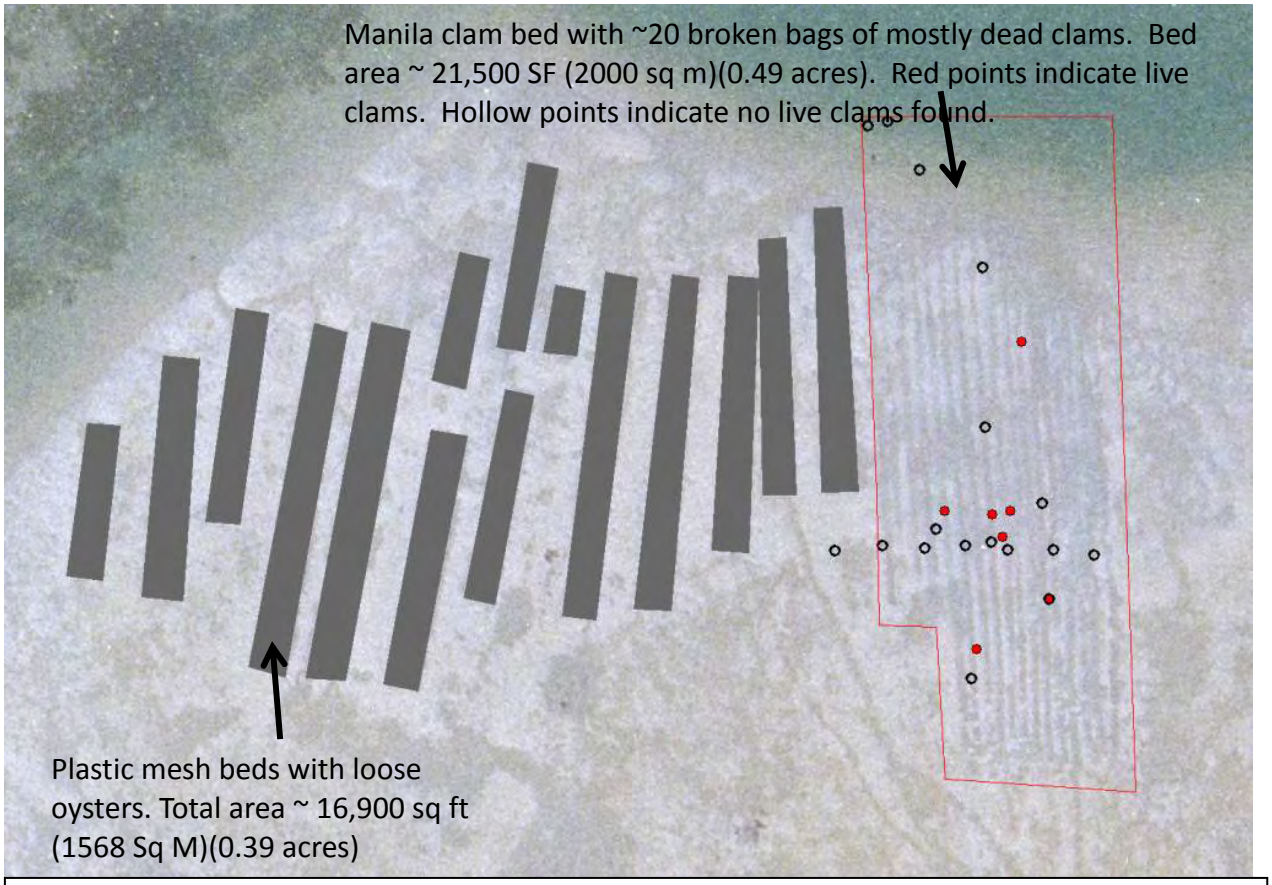


Figure 8: Locations of mesh mats (n = 15) and former Manila clam bed with broken bags and live clams in the sediment. See Figure 2 (Project Map) for location with project area.

These fabricated mesh mats are made of plastic fabric that is long-lasting in the natural environment. Removal actions will benefit and restore approximately 0.39 acres of sandbar habitat. Additionally removal of remaining free pacific oyster from areas on the mats will jump-start the long-term volunteer stewardship removal efforts of those oysters outside of the established mats (See Drakes Estero Stewards Program description below).

Removal of Established Anchors and Lines

DBOC provided GPS locations of more than 30 plastic anchors that would be left at the close of their operations in areas of Bed 17 (Figure 10), Bed 7 (Figure 9), and Bed 39 (Figure 11). The NPS has observed that these anchors still include a network of connected lines. Additional infrastructure, including cinder block anchors and many other lines will be removed as they are encountered (See Figure 12).

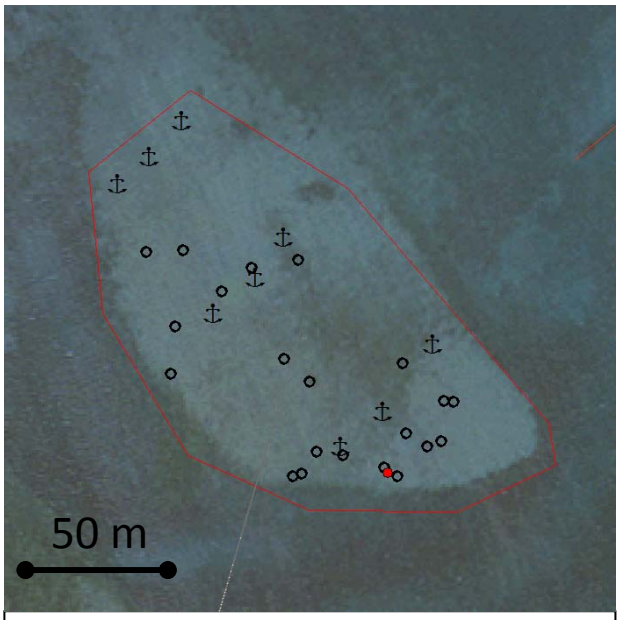


Figure 9: Former manila clam bed (Bed 7) with ~10 broken bags of dead clams. Bed area = approx. 20,000 sq m. (4.94 acres). Red points indicate live clams. Hollow points indicate no live clams found. Anchor symbols are plastic anchors.

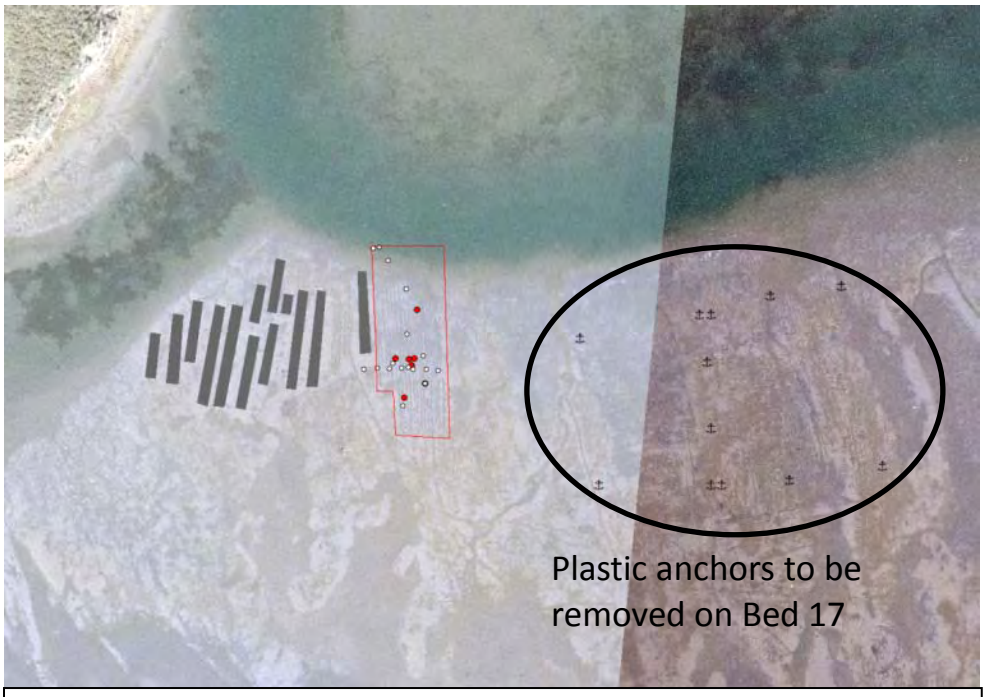


Figure 10: Plastic anchors to be removed on Bed 17.

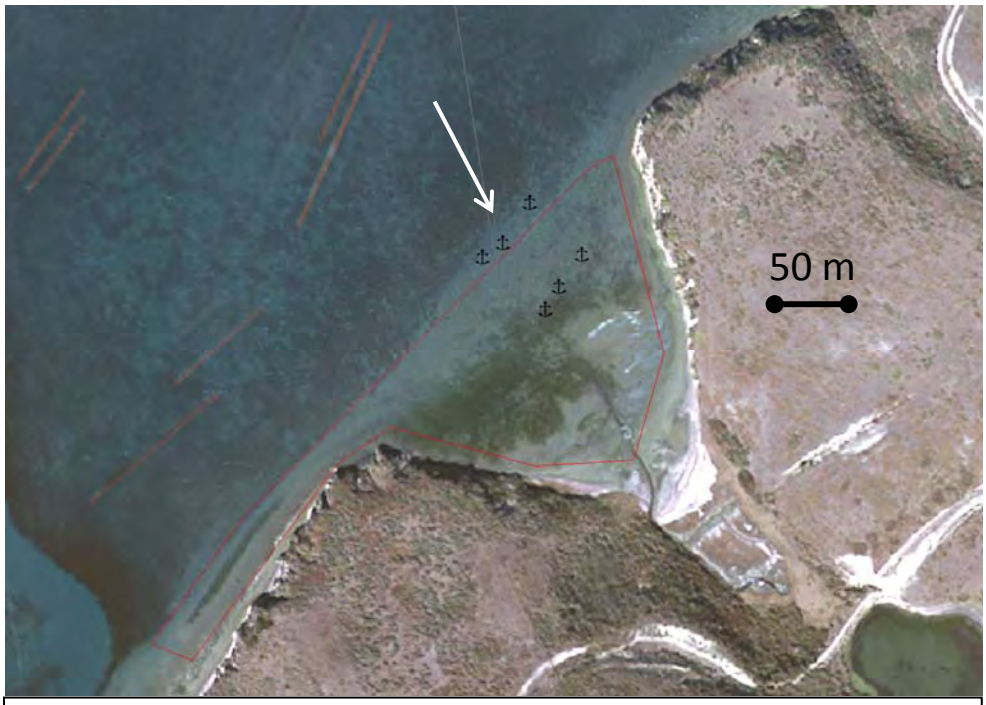


Figure 11: Plastic anchors to be removed on Bed 39.

Figure 12: Examples of screw anchors and lines on Bed 17.

Anchors and lines provide unnatural habitat for attachment of marine fouling organisms on sandbar areas. Removal of anchors and lines and other debris is important to long-term protection and restoration of the sand bar areas.

Removal of Uncontained Manila Clam

As part of reconnaissance surveys in early January 2015, the NPS identified specific areas where bags of manila clam had broken, with most clams distributed on the sandbar (Figure 13). An attempt to remove these was made by contractors in January, but at that time it was documented that the clams were far more broadly spread than the 10 bags that were initially observed.

Figure 13: Remains of dead and live manila clams from spilled clam bags near bed 17. January 2015. See Figures 8 and 10 for location.

NPS conducted Manila clam surveys on February 17 and 25, 2015 to assess if and how far clams have spread beyond the growing beds. A series of test cores using a small shovel were dug to approx 8" deep with a diameter of 6" and sieved through a 5mm screen. Number and size of manila clams were recorded. 22 test holes were sampled near bed 15-17 and 22 were sampled on bed 7. Both sites were active manila clam growning areas and had manila clam bags (both in tact and spilled) present on January 1, 2015. Sample locations and positive detections of clams are shown in Figures 8 and 9. In the bed 15-17 area, clams were generally only found directly beneath or near broken surface bags, however Grosholz (2010) also found a few Manila clams in the same area. In Bed 7, we found a single live 10mm Manila clam.

Based on current results, the NPS plans to employ limited methods to remove the clam from a 0.49 acre area near bed 17, but will continue to consult with experts to assess whether this action is likely to successully remove Manila clams from Drakes Estero. If determined to have a low probability of success, the NPS would likely not implement this activity. Additional surveys are also required at Bed 7 before NPS proposes to attempt any clam removal.

It is anticipated that this work would be done at low or shallow water conditions over the sand bars, and the potential impacts would be limited to redistribution of existing sand within the sandbar treatment footprint. Water and sand would be immediately discharged to the same area and there would be no lasting effect on sandbar condition or turbidity. There is no eelgrass in these areas, so the work would not result in either direct or indirect impacts to eelgrass.

Drakes Estero Stewardship Program

The NPS anticipates that as part of ongoing monitoring and operations, that additional debris, strings, bags, lines and tubes will be found. The NPS has initiated a long-term volunteer effort – Drakes Estero Stewards Program – that will assist with mapping, monitoring and debris collection that will engage the public in the restoration effort. Through this program, we anticipate continuing removal of non-native shellfish and culture materials. NPS will provide transport and disposal of debris collected by volunteers. The planned sites of volunteer clean-up are shown on Figure 2. As of March 11, 2015, the NPS has signed up 12 formal volunteers for the program, has a ~25 person kayak clean up and mapping program planned for after the harbor seal pupping season (with the Petaluma Paddlers). Also, *Leave No Trace* and the Point Reyes National Seashore Association have scheduled a shoreline cleanup for April 11, 2015. The NPS anticipates that marine debris removal will continue on for multiple years through ongoing volunteer efforts such as these.

Drakes Estero Monitoring Program

Two individual but complementary bottom condition monitoring programs will be conducted to (1) determine the effectiveness of the experimental treatments to inform future shell pile treatments within Drakes Estero and in other marine systems (see Appendix B), and (2) assess the overall level of changes in cover of eelgrass, marine debris, and fouling organisms for the entire rack removal and shell mixing program. (see Appendix C). These programs consist of basline and follow up underwater assessment of cover of eelgrass, marine debris and fouling organisms and are described in detail in the appendix.

Additionally, since 1997 the NPS has conducted a long-term harbor seal monitoring program in Drakes Estero (and the entire Point Reyes Peninsula). Maintenance of this monitoring program will be important to document and track any changes in the breeding season harbor seal population pre and post-restoration (see Appendix C).

Construction Monitoring and Impact Avoidance

As part of the Drakes Estero Restoration Project, the NPS has identified a number of general conditions and constraints to ensure protection of sensitive resources during the project. Appendix D includes a number of operational practices and constraints intended to reduce or avoid impacts to resources as part of the on-water operations. The NPS will have an onsite inspector to oversee

operations with the ability to identify and cease work as necessary to minimize impacts. Additionally, the project will have post-treatment inspection surveys to document completed condition to ensure that removal requirements and restoration objectives are achieved.

Pinniped Avoidance Program
The NPS has a long-term pinniped monitoring program that will assess harbor seal populations in Drakes Estero both pre-and post-restoration (Appendix C). For the duration of the restoration, we will supplement this program by placing observers on shore during low tides (<2.5 ft) to monitor the upper sandbar near Bed 7 during rack removal operations. If seals are hauled out, the observer will communicate this to work crew leaders to alter operations to another location until the tide has risen.

For restoration work at near beds 15 and 17, observers will monitor the area for hauled out seals and contact work crew leaders to alter operations to another location until the tide has risen and seals have left.

To minimize impacts to seals, all proposed restoration work is being conducted outside the harbor seal breeding and pupping season (March 1 – June 30). Therefore, seal occupancy on sandbars is low, and we anticipate the impacts to seals will be easily avoided using this protocol.

IV. CONSISTENCY WITH PROVISIONS OF THE CALIFORNIA COASTAL ACT

This portion of the federal consistency determination analyzes consistency between policy sections of the California Coastal Act (Division 20, California Public Resources Code) and NPS proposals and actions on federal lands, waters and subtidal land included within the California Coastal Zone boundary. The relevant policies are listed first, followed by comment and analysis.

Policies under the California Coastal Act that are not applicable to the NPS proposal are:

- Article 2 (Public Access), section 30212 – New Development Projects;
- Article 3 (Recreation), section 30222 Private Lands;
- Article 4 (Marine Environment), section 30233(a) (1-5), 30233 (c) and (d), 30234, 30234.5, 30235 and 30236;
- Article 5 (Land Resources) section 30241, 30241.5, and 30243;
- All sections of Article 6 (Development); and
- all sections of Article 7 (Industrial Development).

ARTICLE 2, PUBLIC ACCESS

Section 30210. In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30211. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30212.5. Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social and otherwise, of overcrowding or overuse by the public of any single area.

Comment and Analysis: Access to the coastal zone within and adjacent to the project area is provided by Sir Francis Drake Boulevard, Drakes Estero Road, Estero Trail, Bull Point Trail and by water access from Limantour Beach. Drakes Estero Road terminates at the head of Schooner Bay and the public kayak launch to Drakes Estero. A publically accessible vault toilet is located at the kayak launch. The gravel road and parking area are maintained by the National Park Service for visitor access.

Estero Trail is a 9.2 mile trail between Home Ranch and Muddy Hollow which traverses the western portions of Drakes Estero including the Home Bay and Estero de Limantour bluffs. It also accesses the 1.4 mile Sunset Beach Trail and 1.7 mile Drakes Head Trail, which provide further access and overlooks of Drakes Estero and Limantour Spit. Bull Point Trail is a 1.8 mile trail that is accessed from a parking area directly off of Sir Francis Drake Boulevard. The trail winds through pastures and provides access and overviews of the central portions of Drakes Estero. Visitors may launch kayaks and other non-motorized boats from the Drakes Estero kayak launch as well as Limantour Beach access.

Public access to each of these areas is free year round. There are seasonal restrictions to boat access within Drakes Estero between March 1 and June 30 annually to protect sensitive harbor seal pupping colonies.

Section 30213. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided Developments providing public recreational opportunities are preferred.

Comment and Analysis. No entrance fee is charged for access to federal lands and waters at Point Reyes National Seashore. There are four public campgrounds within the Seashore that are accessible through the Recreation.gov reservation system. The Point Reyes Hostel is located near Limantour Beach and is operated as a concession by the Hosteling International. It provides overnight accomodations to up to 56 visitors nightly at affordable nightly rates of less than $30 for dorm room accomodations. Private room accomodations range from $87-$130 per night.

Section 30214. (a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following:
(1) Topographic and geologic site characteristics.
(2) The capacity of the site to sustain use and at what level of intensity.
(3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses.

(4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter.

Comment and Analysis. The Drakes Estero Restoration Project will enhance public access related to "the capacity of the site to sustain use" and "the fragility of the natural resources." As a designated marine wilderness, public access is accomplished by foot or non-motorized boat. For more than 10 years, the NPS has instituted a seasonal recreational boat closure within Drakes Estero to protect harbor seal pupping areas from disturbance. This seasonal closure begins on March 1 and extends through June 30 annually. The public still has access to the shoreline and adjacent trails for enjoyment of Drakes Estero.

It is anticipated that during the period of deconstruction and restoration, access to the public parking and access point, as well as boat access on the water will be limited in order to facilitate safe transport and transfer of materials across the water and onshore. Once restoration actions are complete, the public will have access to the Estero consistent with NPS and wilderness requirements.

ARTICLE 3, RECREATION

Section 30220. Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.
Section 30221. Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

Comment and Analysis: In fulfillment of the NPS mission, the NPS protects the coastal zone within Point Reyes National Seashore for public enjoyment and education. The park protects more than 80 miles of coastline from development, attracts an average of 2.5 million visitors per year and supports 28 federally listed species. The park boundary extends ¼ mile offshore including near-shore and marine waters. These coastal waters include more than 6,000 acres of the Philip Burton Wilderness and are home to four state Areas of Biological Significance, four State Marine Protected Areas and 3 Special Closure Areas. The Drakes Estero Restoration is consistent with the recreation provisions of the California Coastal Resources Planning and Management Policies.

Section 30222.5 *Oceanfront land that is suitable for coastal dependent aquaculture shall be protected for that use, and proposals for aquaculture facilities located on those sites shall be given priority, except over other coastal dependent developments or uses.*

Comment and Analysis: Drakes Estero became designated wilderness on December 4, 2012. Commercial uses such as commercial aquaculture are not allowed in federal wilderness areas. In addition, the Reservation of Use and Occupancy and Special Use Permit that had authorized commercial aquaculture operations within Drakes Estero and on the adjoining uplands terminated on November 30, 2012. Subsequently, the Drakes Bay Oyster Company entered into a Settlement Agreement and Consent Decree (SA/CA) with the National Park Service under which DBOC relinquished any right to conduct aquaculture in the future. The SA/CD was approved by the U.S. District Court for the Northern District of California on October 8, 2014 [Case4:12-cv-06134-YGR

Document 157 Exhibit 1]. Because commercial agricultural use of Drakes Estero is no longer feasible, the adjacent uplands are no longer suitable for aquaculture. The restoration project intends remove all infrastructure and marine debris from the former operation in order to provide natural ecological habitat and function within Drakes Estero.

Section 30223. Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.

Comment and Analysis: The NPS anticipates maintenance of existing public access and uses of Drakes Estero with completion of the restoration project.

Section 30224. Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.

Comment and Analysis: This policy is generally not applicable to this location because there are not suitable natural harbors or other safe locations within the parks for recreational boating of the type that requires launching, berthing, and storage facilities. The NPS has provided access for kayak put in at the end of Drakes Bay Road, and will maintain and encourage day uses for recreational non-motorized access to Drakes Estero outside of the harbor seal pupping season (March 1-June 30).

ARTICLE 4, MARINE ENVIRONMENT

Section 30230. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Comment and Analysis: As described, the Drakes Estero Restoration Project will remove nearly 5 miles (7 acres) of dilapidated wooden oyster rack structures from the bed and water column of Drakes Estero. A portion of these racks were used for hanging oyster culture as part of the Drakes Bay Oyster Company and are in various states of repair, ranging from intact to completely collapsed. Unpermitted repair of these racks were the subject of earlier CCC enforcement actions. It is estimated that more than 200,000 linear feet of dimensional lumber will be removed from the bed and water column of Drakes Estero as part of this project. The removal of the entirety of the racks will restore natural conditions to this dynamic tidal estuary. Additionally, the project will remove accumulated tubes, strings and bags from approximately 1 acre of subtidal land and to treat accumulated shell on an additional 1.4 acres of subtidal land.

Visitor use on Drakes Estero will remain consistent with wilderness status and fishing limitations established through the Drakes Estero SMCA. Non-motorized access on the water is available by kayak and canoe, and will continue following completion of the restoration activities. For more than 10 years, the park has maintained a seasonal closure to recreational boating between March 1 and June 30 for the protection of harbor seals during the sensitive pupping season.

Section 30231. The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies an& substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Comment and Analysis: The Drakes Estero Restoration Project seeks to restore natural conditions to Drakes Estero through the removal of oyster culture infrastructure and debris, and restoration of more natural conditions as described in the Project Description. Overall the project will remove oyster rack infrastructure from approximately 7 acres of Drakes Estero. The project will restore natural conditions to this marine ecosystem through the removal of aquaculture infrastructure and debris. In addition the project will implement monitoring programs to document response to the removal efforts and to determine if additional activities are required to meet project goals.

Section 30232. Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Comment and Analysis: As described, the use of hydraulic equipment, primarily excavators is necessary to provide the appropriate level of removal strength as well as flexibility in operations. The park will include a requirement to address and reduce potential for impacts associated with failure of hydraulic lines. The contract will require the use of food grade vegetable oil as the hydraulic fluid in all hydraulic equipment used on the estero. In addition, a response plan is will be required to be developed by the contractor that details the containment protocol in the event of a fuel or oil spill.

The NPS will maintain some need to access Drakes Estero using motorized boats for ongoing remediation, monitoring, and emergency rescue situations. The NPS will continue to evaluate motorized use needs consistent with Wilderness policy to determine how best to miminize impacts to wilderness character. Long-term recreational access to Drakes Estero will be achieved by non-motorized boats.

The NPS has responded to had observed oil spill behaviour in this area. As part of the Cosco Busan spill in November 2007, the NPS attempted to deploy booms across the mouth of Drakes Estero and determined that this was not viable. On a case-by-case basis the NPS will evaluate any attempt to isolate the Estero in the context of wilderness policy, resource protection and oceanographic and tidal processes. Any attempts to protect areas within the Estero from a spill originating outside of the Estero would likely be isolated to specific areas, as the tidal dynamics are such that the area cannot be isolated at the mouth.

Section 30233(a). The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource dependent activities.

(b) *Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.*

Comment and Analysis: The Drakes Estero Restoration Project, as documented in the Project Description above, will result in short-term temporary impacts to eelgrass and other subtidal habitat during the removal of more than 5 miles of oyster rack infrastructure and other remaining marine debris associated with the operations. The NPS has analyzed the extent of impact and identified that the area of impact is far less than the area that will benefit from the restoration actions. The project activities including Rack Removal and Removal of Aquaculture Debris will result in cumulative impacts to approximately 50% of the subtidal lands within the 7.07 acre footprint of the racks. With respect to eelgrass, the project will result in direct impacts to 24,130 SF (0.55 acres) of eelgrass which is approximately 19% of the total eelgrass within the footprint of the racks and represents only 8% of the overall project area. This small percent impact has been determined as a result of field reconnaissance and assessment of project activities. As part of the project, limited excavation will be conducted to remove accumulated oyster bags, strings and tubes, as well as to establish monitoring plots to determine the best treatment method to accommodate eelgrass growth within areas of oyster shell debris.

Additionally, the NPS has identified approximately 0.4 acres of area on the sand bars where plastic mesh mats and other debris including cinder block anchors and lines will be removed. The NPS is also analyzing whether to undertake manila clam removal actions on a 0.5 acre area. If further tests indicate that escaped clams remain isolated and they are not prevalent within other areas of the Estero, the NPS will conduct this action with the intent of containing or removing this nonnative species.

ARTICLE 5, LAND RESOURCES

Section 30240(a). Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

Section 30242. All other lands suitable for agricultural use shall not be converted to nonagricultural uses unless (1) continued or renewed agricultural use is not feasible, or (2) such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. Any permitted conversion shall be compatible with continued agricultural use on *surrounding lands.*

Comment and Analysis: Drakes Estero became designated wilderness on December 4, 2012. Commercial uses such as commercial aquaculture are not allowed in federal wilderness areas. In addition, the Reservation of Use and Occupancy and Special Use Permit that had authorized commercial aquaculture operations within Drakes Estero and on the adjoining uplands terminated on November 30, 2012. Subsequently, the Drakes Bay Oyster Company entered into a Settlement Agreement and Consent Decree (SA/CA) with the National Park Service under which DBOC relinquished any right to conduct aquaculture in the future. The SA/CD was approved by the U.S. District Court for the Northern District of California on October 8, 2014 [Case4:12-cv-06134-YGR Document 157 Exhibit 1]. Commercial agricultural use of Drakes Estero and the adjacent uplands is no longer feasible. The restoration project intends remove all infrastructure and marine debris from the former operation in order to provide natural ecological habitat and function within Drakes Estero.

Section 30244. Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Comments and Analysis: A Determination of Eligibility (DOE) was prepared for the onshore and offshore facilities associated with the Johnson's Oyster Company/Drakes Bay Oyster Company (DBOC) (Caywood and Hagen 2011). The DOE found that while the oyster-growing operation in Drakes Estero is significantly associated with the rebirth and development of the California oyster industry, which began in the 1930s, the property is ineligible for listing in the National Register because it lacks historic integrity. With regard to integrity of materials, workmanship, and design, however, virtually all of the resources in the plant have been modified through structural additions and/or the application of modern materials. Today, the plant bears little resemblance to the facility of the early 1960s. In a letter dated July 8, 2011, the NPS submitted the DOE to the SHPO, requesting concurrence with the finding that the property is ineligible for listing on the National Register. In an August 4, 2011 letter, the SHPO concurred with the NPS determination that none of the facilities associated with DBOC's operation are eligible for listing on the National Register (SHPO 2011).

On January 9, 2012, the NPS initiated consultation under NHPA Section 106 with SHPO and the Federated Indians of Graton Rancheria (FIGR). The NPS requested that the SHPO and FIGR review all of the alternatives presented in the EIS. The FIGR issued a letter on August 13, 2013 concurring with the NPS determination of "no adverse effect" on cultural resources for all of the alternatives considered in the EIS. On October 29, 2012, the SHPO issued a letter to the NPS with a finding of no adverse effect for all of the alternatives considered in the Draft EIS. The SHPO and FIGR concluded there would be no adverse effect to historic resources regardless of the actions at the site. As such, the removal of all structures from the upland portion of the site is consistent with SHPO and FIGR consultations.

ARTICLE 6, DEVELOPMENT

Not Applicable - The Drakes Estero Restoration Project will remove the remaining structures from the waters of Drakes Estero and restore natural conditions within this dynamic estuary. Removal of 95 racks comprising nearly 5 miles in length, accumulated marine debris and shell from areas beneath the racks, anchors, lines and shell mats from sand bars, and other non-conforming structures from Drakes Estero will result in maximum wilderness and coastal resource protection in this area.

ARTICLE 7, INDUSTRIAL DEVELOPMENT

This article does not apply to Point Reyes National Seashore or the Drakes Estero Restoration Project.

APPENDIX A

Eelgrass and Debris Assessment and Assumptions

The Drakes Estero Restoration Project will have some short-term impacts on eelgrass and seabed habitats. To quantify these impacts (and for project planning), NPS staff collated and collected data consisting of rack locations and conditions, aerial imagery, a sediment map, eelgrass maps, high definition underwater video, site visits to sandbars at low tide, and visual snorkel surveys or racks and rack footprints. This information was used to quantify the area of rack posts and deadmen in eelgrass and the area of debris (shell, plastic, etc.) that lies on the seafloor and is a candidate for removal or treatment. Staff also calculated areas on sandbars where aquaculture equipment and shellfish may be removed.

The NPS initiated an aerial flight of Drakes Estero at a low tide, collected extensive underwater video from snorkeling and alongside the boat, and visited many of the active growing beds on sand bars throughout Drakes Estero. The NPS has also relied on information regarding rack condition, status and use provided by DBOC between 2010 and 2014, as well as sediment type information derived from Anima 1990. NPS has relied on a 30cm aerial image from 2009, a 10 cm aerial image from January of 2015, NPS conducted side-boat video surveys on 59 racks, and reviewed other video on an additional 12 racks [71 of 95 (75%) total racks] to make assumptions used to derive information presented in this impact analysis. Analysis of these various sources has been used to compile and assess information that contributes to our understanding of the rack removal activities as well as the potential impacts associated with this work.

Methods

Quantification of the total eelgrass and debris under racks was done by classifying the proportion of a rack having differing cover classes of eelgrass or debris, and then multiplying the result by the total area of the rack. If eelgrass only surrounded the edge posts of a rack, a multiplier of 2/3 was used (since racks are 3 posts wide). This was then multiplied by the length of the rack having eelgrass.

Bents and Stringers

The racks are comprised of vertical bent structures sunk into the mud, and horizontal stringers that were used to hang oyster strings. Vertical bent structures consist of three (3) vertical 2x6 inch posts affixed and stabilized by a 14-foot long 2x6 inch horizontal cross-member. Our observations indicate that in some cases, the cross-member is buried below the mud line, but in other cases it is at or above the mud line. The three vertical spars stick down into the mud approximately 5 feet. We have identified four racks representing approximately 80 bents where the posts are 4-inch round poles, which do not appear to have the bottom cross-member.

Based on the rack removal investigation, the area of disturbance to the Estero floor is limited to within 6 inches of the post being removed. Therefore, the anticipated disturbance is between 1 to 1.3 SF per post and 1 SF per lineal foot of bottom cross-member. If the cross member is at or above the mud line, it is anticipated that the disturbance area identified above would be the same.

Table 1. Summary of Cumulative and eelgrass impact areas.

Impact area for posts and deadmen are estimated based on general observations of impact area from the method pull test. The estimate for stingers is based on their dimensional footprint (approx. 4" wide by length of stringer). Deadmen are not included for Racks 4A, 8A, 8B and 8C. Aquaculture debris is included within the Moderate/Heavy debris area calculation, so it is not double counted in the total. The debris experiment area is subtracted from the Shell debris area. All values are estimated from underwater video footage from 71 of the 95 racks. Level of error for eelgrass cover, stringers on the estero floor, shell debris, and plastic/wire is unknown, but is likely less than 25%.

	Cumulative Impact Area		Eelgrass Impact Area	
Component	**Sq Ft**	**Acres**	**Sq Ft**	**Acres**
Within Rack Footprint				
Posts (assume 1.3 SF/post)	8,713	0.20	3,572	0.08
Bottom Cross-member (assume 1 SF/LF)	30,072	0.69	12,726	0.29
Stringers on Estero Floor (total area of boards covering bed of Estero)	11,928	0.27	6,232	0.14
Moderate/Heavy Aquaculture and Shell Debris	103,830	2.38	0	0.00
Aquaculture Debris – Bag, Tube and String Cleanup*	41,818	0.96	0	0.00
Shell Debris Treatment Experiment*	2,880	0.07	0	0.00
Total Impact Area within Rack Footprint	**154,542**	**3.61**	**22,530**	**0.52**
Total Project Area within Rack Footprint	**308,016**	**7.07**	**126,287**	**2.90**
Outside Rack Footprint				
Dock and Anchors[#]	3,200	0.07	1,600	0.04
Oyster Mat Removal	16,988	0.39	0	0.00
Manila Clam Treatment (Bed 17)	21,344	0.49	0	0.00
TOTAL IMPACT AREA	**196,075**	**4.50**	**24,130**	**0.55**
TOTAL PROJECT AREA	**349,549**	**8.02**	**127,887**	**2.94**

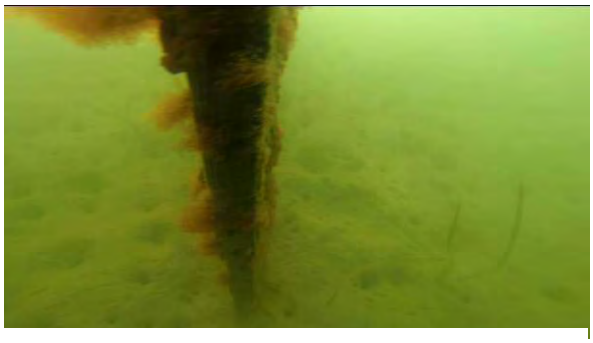
*areas within Total Moderate/Heavy Shell Debris Area

[#]see text for calculation of eelgrass impact

Eelgrass

Field evaluations, including snorkel and side-boat video collection has informed our base of information regarding presence/absence and potential effects of rack and debris removal on eelgrass within Drakes Estero. From video, we placed areas under racks into one of 5 broad cover classes estimated visually without the aid of test points: 0, <5%, 5-25%, 25-75%, and>75%. It was not feasible to assess shoot density. For reproducability, cover was always estimated in conditions where eelgrass was floating in low current conditions. Below are examples of each eelgrass coverage class.

***No eelgrass**. Rack 6E on 1/29/2015*



***Very Low (<5%)** eelgrass coverage. Post in sediment on Rack 11I on 1/30/2015. Note single eelgrass plant approximately 18" from post.*

***Light (5-25%)** eelgrass coverage under rack 11H on 1/30/2015*

***Moderate (25-75%)** eelgrass coverage under rack 8P on 01/28/2015.*

***Dense (>75% cover)** eelgrass. This density only occurred under part of rack 41. All other racks surveyed were <75%, but racks 22E and 22F are close to 75%.*

Using the avialable data, under the 54 racks that were actively used through the fall of 2014, eelgrass is limited to absent within the footprint of the rack. For racks that have long been collapsed (e.g. classified as in poor condition by DBOC in 2010), it is common that there is

eelgrass growing within the footprint of the rack if shell debris is minor or absent (see below). In many cases, just outside the rack footprint, eelgrass coverage is moderate to dense. Similarly, with respect to debris accumulation, we have found that in areas of moderate to heavy accumulation, eelgrass is not present, but in areas of low debris accumulation, we have observed some eelgrass growing between debris and/or shell.

Our calculations for eelgrass are based on the following information. For 71 racks, NPS staff reviewed and identified the number of bents where eelgrass was present around the base of the posts, over buried cross-members, or outside the footprint but within the 1-foot overlap area of the buried cross-member. Based on our assessment, we estimate that approximately 41 percent (2,719 of 6,702) vertical posts are located in areas where eelgrass is present. Additionally we estimate that there are 839 cross-members that are present in areas where eelgrass is present, and would likely result in impacts to eelgrass when the cross-member is pulled out with the bent. In the case where the cross-member is exposed above the sediment line, we have not assumed impacts to eelgrass from the removal of the cross-member.

Debris Accumulation

The same video surveys used to assess eelgrass distribution were used to assess accumulation of shell and other debris beneath the racks. Based on our visual analysis we identified three categories of debris accumulation – heavy, moderate, and low.

Debris is defined as items on the estero floor including pvc tubes (both French tubes and other PVC), wires, rope, oyster shells, loose live Pacific oysters, and bags of oysters. We enumerated fallen wooden oyster racks separately, so they are not included in this cataloging of debris. We also totaled debris from the aquaculture equipment (tubes, wire, strings) seperately from oyster shell, since the restoration may require differing methods We used 3 general categories to describe the cover of debris: low, moderate, and heavy. Examples are provided below.

Low Debris is defined as covering less than <25% of the visible estero floor. This generally consisted of scattered oyster shells under racks, but also may include small amounts of wire and PVC pipe.

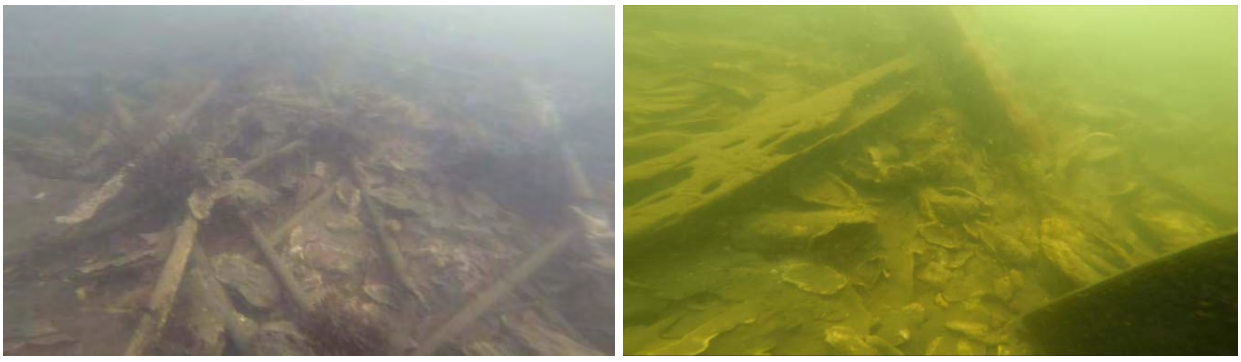
Minor debris by post under rack 22D on 1/30/2015. Note plastic spacer tubes with wire and scattered oyster shell.

Moderate Debris is defined as covering approximately 25-75% of the visible estero floor. This generally consisted of numerous oyster shells under racks, but also wire and PVC pipe. Eelgrass is rarely in the moderate debris areas.

Moderate shell debris under rack 9C on 1/1/2015.

Upper end of moderate class of debris under rack 9C on 1/29/2015

Heavy Debris is generally defined as having >75% cover, precluding eelgrass growth and covering most of the estero floor under a rack. This periodically includes large piles of oyster bags or French tubes that have fallen from the rack and almost always includes complete bottom coverage of oyster shell. It is unknown how deep into the sediment this debris may be.



Examples of heavy debris: (Left) oyster shell and French tubes under rack 6B on 1/29/2015, (Right) oyster shell under rack 22B on 1/30/1015.

Heavy debris on rack 9C on 1/29/2015.

APPENDIX B.

Experimental Treatment of Oyster Shell Debris Beneath Racks

There is little research demonstrating the efficacy of removing oyster shell from bay sediments to restore eelgrass habitat (E. Grosholz, pers. comm.). Complete removal may lower the seafloor, leaving a trench that could impede eelgrass regrowth (K. Boyer, pers. comm.). It is known that eelgrass can grow well in substrate with coarse pebbles and rocks as long as there is adequate silt or sand in the interstitial places, but the tolerable ratios have not been determined (K. Boyer, pers. comm.). There is no experimental data demonstrating whether eelgrass will grow into a shell/sediment matrix. We are therefore proposing to perform several in-situ ("mix-in") treatments of both heavy and moderate oyster shell debris coverage with underlying sediment and then monitor the treatments and controls to assess eelgrass growth. Treatments and controls will be in areas where eelgrass already grows adjacent to the treatment plots, providing an opportunity for vegetative growth.

The treatments (12'x12' plots roughly the area of one oyster rack "bent") will each be replicated 10 times. The treatments include:

1. Heavy Shell cover areas (>95% cover of shell)
    a. Removal of the majority of shell from the test plot
    b. Mixing the surface shell into the substrate to create a shell/sediment matrix.
    c. Control plots with heavy shell cover and no manipulation
2. Moderate Shell Cover Areas (25-75% cover of shell)
    a. Removal of the majority of shell from the test plot
    b. Mixing the surface shell into the substrate to create a shell/sediment matrix.
    c. Control plots with moderate shell cover and no manipulation

All treatment plots will be conducted in a split plot design in groups of 3 (removal/mixing/control) to minimize location effects. The linear order of the treatments will be randomized and in no case be at the end of a rack, since the ends of racks could have existing eelgrass on 3 sides of the plot, whereas non-end plots would have pre-experiment eelgrass at most on two sides of the plot. Racks suitable for treatment 1, treatment 2, and control split plots are listed in Table 1. There are 11 potential racks that meet the needs for a heavy shell treatments, and 10 potential racks that meet the needs of the moderate shell treatments. Note that there is some variation in shell coverage classes under single racks, meaning that a heavy treatment may occur in one section of a rack, and a moderate in another section. Each plot will have the 4 corners marked with white ¾" PVC pipe that protrudes approximately 40 cm above and 100 cm below the bay floor to ensure easy and accurate relocation of plots. The top of the pipe marker will still be ~60 cm below the water surface at most low tides. WAAS GPS will also be used to record all plot locations for relocation.

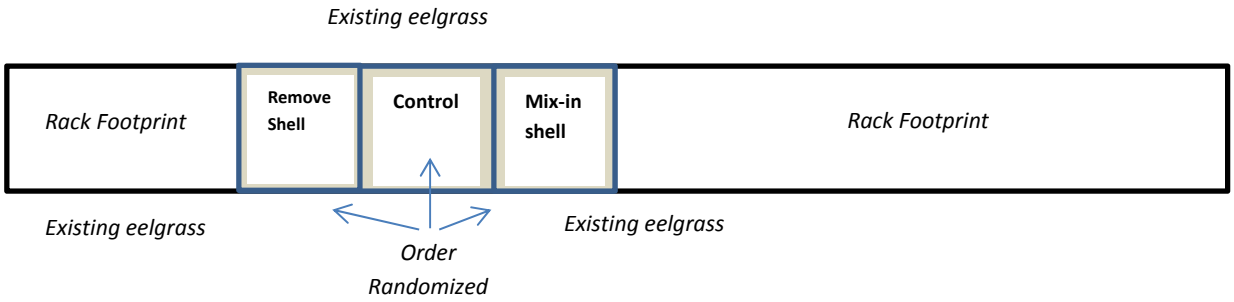


Figure 1. Experimental design showing treatments within the footprint of an oyster rack surrounded by existing eelgrass. Racks are 12' wide and each plot will be 12'x12'. This design will be replicated 10 times each in in areas of heavy and moderate oyster shell coverage.

Each of these test plots (n = 60, length = 720 ft, area = 8,640 sq ft) will be recorded by snorkelers using high definition video recordings to calculate percent surface cover of shell (or other debris), eelgrass, bare sediment, and invasive fouling organisms. Down looking videos will be transformed into still images, which will be sewn together in Adobe Photoshop to have a complete image of each plot. Then 100 random points will be overlain on the composite image and number of "hits" for eelgrass, shell debris, other algae, fouling organisms, and substrate will be recorded. Plots will be recorded prior to treatment and one year post treatment. Additional surveys in subsequent years will be conducted if no trends are noted after 1 year.

Table 1. Racks suitable for test plots with heavy or moderate oyster shell debris and adjacent eelgrass coverage. Racks in bold have both heavy and moderate treatment potential

Heavy Shell Debris	Moderate Shell Debris
6E	4C
6F	4D
8H	**6E**
8K	**6F**
8M	**8N**
8N	12A
22A	12B
22B	13B
22E	**22B**
22F	41C
38A	

Percent cover of eelgrass, sediment, shell, algae, and fouling organisms will be compared among treatments using simple generalized linear models with the factor being treatment and the appropriate distribution for percent cover data (which is rarely normal).

The California Department of Fish and Wildlife (CDFW) is conducting a parallel monitoring project assessing eelgrass growth under racks throughout the estero before and after rack removal. This non-manipulative monitoring (other than pre and post oyster rack removal) will provide information on trends in growth of eelgrass in areas of heavy, moderate, light and zero shell cover. K. Boyer (SFSU) has hypothesized that light coverage of oyster shell on the surface may in fact promote eelgrass seed growth by protecting seeds from being carried away by the current. It is not known in Drakes Estero how much eelgrass spreads by seed vs. vegetatively, but these CDFW monitoring a variety of oyster coverage classes (including light oyster shell coverage) will help answer that question since we can compare areas of no shell vs light shell.

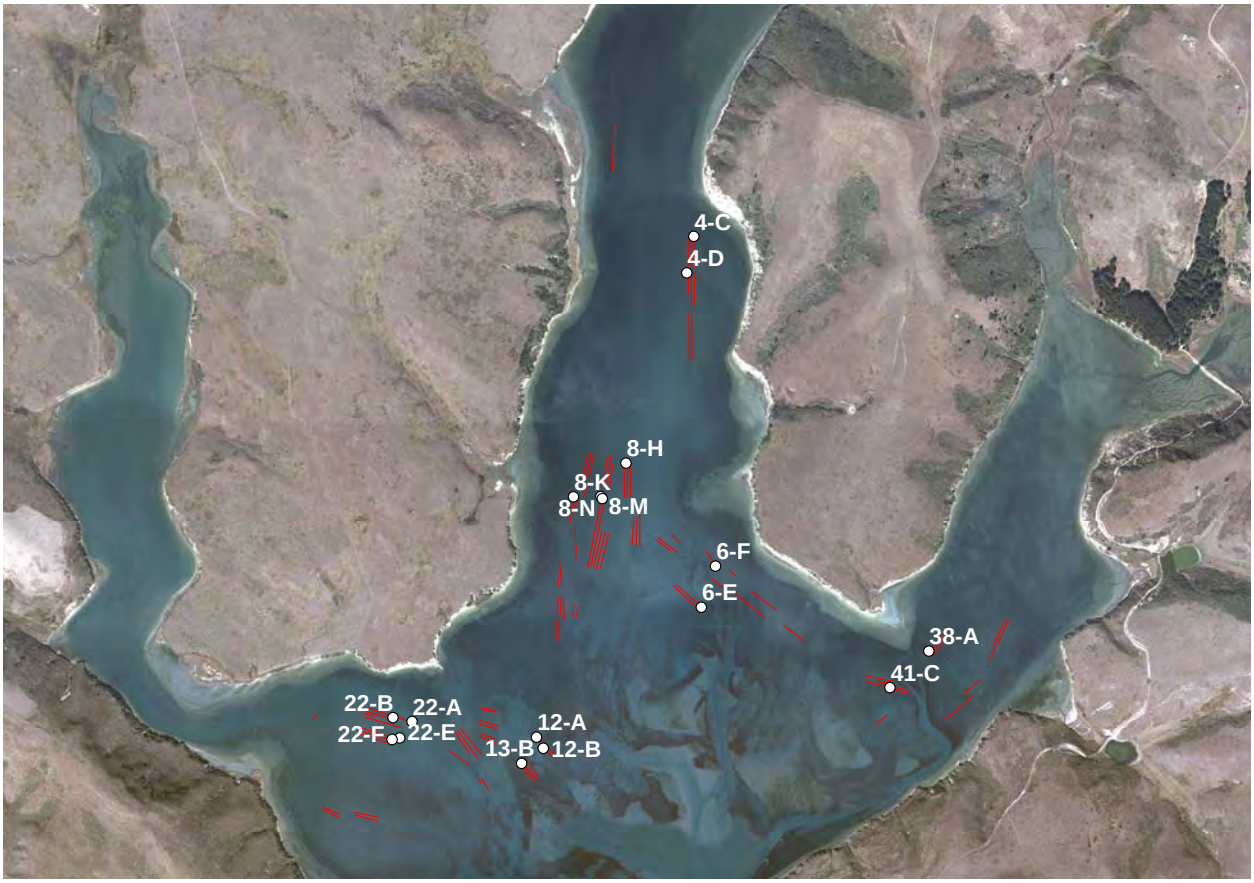


Figure 2: Rack Locations suitable (shell debris under racks and eelgrass growing adjacent) for experimental shell removal, shell mixing and controls. We anticipate using all of these racks. See Table 1 and text for details.

APPENDIX C

Drakes Estero Restoration Monitoring Plan for Compliance Package

Part 1. Eelgrass, debris, and fouling organisms.

Oyster racks and associated debris may have had impacts on (1) eelgrass cover, (2) marine debris (oyster shell, wire, plastic) on the estero floor and (3) associated fouling organisms. The California Department of Fish and Wildlife has proposed to monitor and been granted an NPS research permit to assess the response of items 1-3 through time after the removal of oyster racks by NPS.

Objectives

1. Determine response in cover of eelgrass, marine debris, and non-native fouling organisms to oyster rack removal.
2. Calculate the net change in the area of eelgrass cover under racks.

Methods

Scuba and a video camera sled will be used to record baseline (before rack removal) conditions in April 2015 by CDFW staff. Surveys will consist of 15 randomly selected transects running the entire length under existing oyster racks. Divers will travel the length of the rack recording video for post processing into calculations for cover of eelgrass, marine debris, and fouling organisms. Additionally, 15 randomly selected control transects will be established in similar depth and sediment type areas near treatment racks and surveyed in an identical manner. Transect sites will be marked at one end with a completely submerged PVC marker to ensure that sites can be accurately resurveyed after racks are removed.

Percent cover of eelgrass derived from video footage using standard CDFW methods will be transformed to area and extrapolated from the randomly selected racks to the unsampled racks, including an error calculation. This will allow a calculation of acres of eelgrass habitat restored. Due to sample size limitations, summary statistics and tests for changes in cover over time will be presented on a population level and not stratified by existing rack conditions. (e.g., good or poor). This will result in an estimate for changes in eelgrass area, but not for racks that were recently used (generally good condition) vs those not recent used (poor condition). Nonetheless, a robust estimate of change in eelgrass, marine debris, and fouling invasive species will be reported.

The California Department of Fish and Wildlife has extensive experience in underwater surveys to assess marine protected areas and benthic habitats.

An example of a selection of oyster racks for survey is in Figure 1.

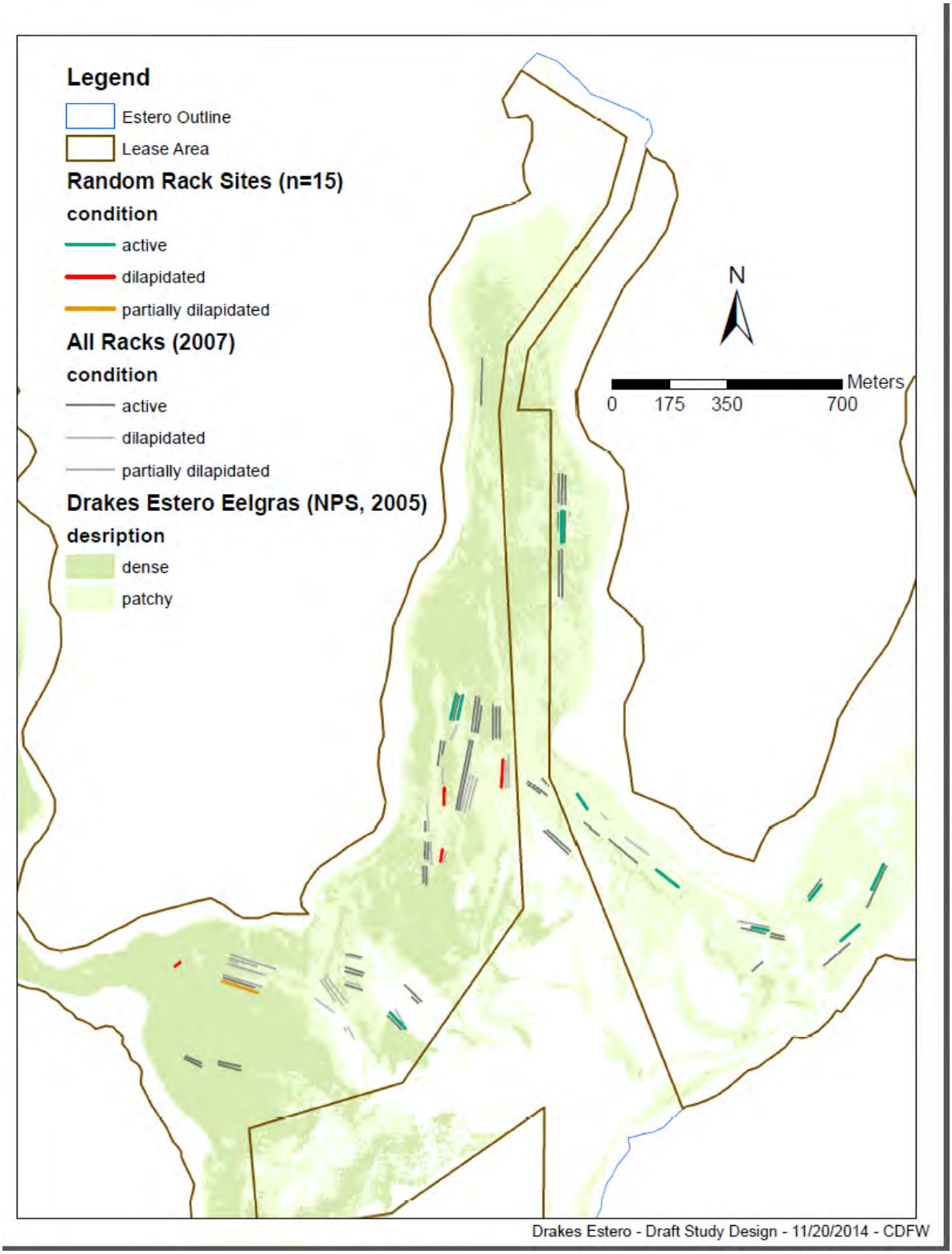


Figure 1. An example of 15 randomly selected survey sites including racks in good (Green) and poor (Red) conditions. Control sites will be randomly placed near treatment racks to ensure a valid comparison.

In addition to the 15 treatment and control transect surveys described above, the CDFW's Marine Protected Area Monitoring Program will also establish scuba/video monitoring transects to assess the overall ecosystem trends in the entire estero (not just rack removal areas) given its status as a state marine conservation area. These surveys will not be designed with the rack locations explicitly in mind, but this information will provide context on broad scale changes in the estuary, complement the control transects, and aid in interpretation of the rack removal monitoring data. These surveys will also commence in April-May 2015 with regular revisits by CDFW.

All surveys will be conducted during high tides to maximize water clarity, minimize sediment entrained by tidal currents, ease the use of scuba, and minimize disturbance to hauled out harbor seals. Surveys will be conducted under an NPS research and collection permit and any use of motorized boats required to deploy scuba divers (some surveys) will be authorized under a National Park Service Minimum Tool Authorization.

Timeline

Initial Sampling	April – May 2015 during mid-high tides
Follow up Sampling	Spring/Summer 2016
Final Sampling	Spring/Summer 2017 (CDFW has not committed to final sampling, in which case this will be funded/replicated by NPS)

Products

1. Report with maps detailing changes in area of eelgrass cover, marine debris, and percent cover of fouling non-native species.
2. Database of video observations with metadata.

Part 2. Harbor Seal Monitoring Program.

Since 1997, NPS has had a long term monitoring program (http://www.sfnps.org/download_product/1497/0) to with these relevant objectives:

1. Determine the long-term trends in population size and seasonal distribution of harbor seal populations at primary sites in the SFAN parks during the breeding and molt seasons.
2. Determine long-term trends in reproductive success of harbor seals through annual estimates of pup production at PORE and GOGA.
3. Determine the long-term trends in sources, frequency and level of effects of natural and anthropogenic disturbances on harbor seal haul out use and productivity.

Harbor seals are sensitive to disturbance. Disturbance at haul out sites can negatively affect reproductive success and reduce or eliminate harbor seal use of specific haul outs. Past monitoring has indicated problems with anthropogenic disturbances at harbor seal haul out areas, and management actions have been applied. The MMPA restricts harassment or disturbance of pinnipeds, therefore the monitoring plan involves observation and recording of incidental or intentional disturbance of pinnipeds.

This monitoring will continue both pre and post restoration to identify trends in harbor seal pupping and population numbers relative to other sites in the park. A peer reviewed annual report is produced by the program that will summarize our findings pre and post restoration.

APPENDIX D.

Operational Guidelines for Moving Boats and Barges in Drakes Estero

This restoration project requires working in a highly sensitive Wilderness area. Many specific guidelines and mitigations are detailed in the main body of the Consistency Determination (CD). The additional overarching guidelines presented here must be followed by contractors conducting work in the estero unless explicitly stated in the CD (e.g., floating dock may be authorized to be placed over eelgrass).

1. **Eelgrass is a special status species in California.**
    a. Do not anchor, trample, cut (with boat props), or destroy eelgrass.
    b. If items to be removed are in eelgrass, carefully remove them to minimize any damage to eelgrass.
    c. Do not allow barges or boats to settle on eelgrass.
    d. If a boat becomes stuck in an eelgrass bed, move the boat out via walking, paddling, poling, or waiting for the incoming tide until the engine can be used without damaging eelgrass or the estero floor.
    e. When departing from the launch site, navigate just to the East of the line of poles. The channel is approximately 15 feet wide.
    f. Use Established Boat Travel Routes as best routes between oyster beds and racks. These are shown in Figure 1 in the CD.
    g. If boats or barges become stuck, do not allow motors to cut estero floor or eelgrass. Use other methods to move the vessel.

2. **Harbor Seals are protected by the Marine Mammal Protection Act.**
    a. Keep a distance of >100 yards from seals at all times.
    b. If seals are hauled out (beached) on or near a potential work area, work in another area that is at least 100 yards away until the seals have left. NPS Observers will also notify work leaders if there are seals to be avoided.
    c. Do not attempt to flush or scare the seals. This is a violation of federal law.

3. **Remove wood, debris, strings of oysters and bags carefully to avoid knocking off fouling organisms.**
    a. Many invasive species occupy the oyster shells and bags. We must avoid knocking these species off when removing them.
    b. Do not scrape the oysters, strings or bags against the racks or boats. Lift them carefully to avoid rubbing off the fouling organisms.
    c. Any fouling organisms that fall on barges, should not be swept off into the water, they should be contained and disposed of on land.

4. **Drakes Estero is a federally designated Wilderness area.**

a. Federal regulations require minimal noise and vessel use to accomplish this oyster removal. Normally this area has no motorized vehicles. Please use engines sparingly and minimize noise as much as practicable.
b. The public may be in the area Kayaking. Please use caution and respect when operating near the public.
c. Only use the far west end of the “Lateral Channel” adjacent to Beds 15 and 17 (Maps to be provided). Do not use the eastern 75% of this channel. This is important seal haul out habitat.