

**REVISED EELGRASS MITIGATION AND MONITORING PLAN FOR
HUMBOLDT BAY ROWING ASSOCIATION
NON-SEASONAL DOCK AND GANGWAY
EUREKA, CA**

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INTRODUCTION

The Humboldt Bay Rowing Association (HBRA) proposes to convert the use of an existing floating dock and gangway from seasonal to non-seasonal/year-round structures (Appendix A, Figure 1 – Vicinity Map). No additional structures or improvements are proposed, but the existing structures would simply remain in place throughout the year and would not be subject to seasonal removal. The HBRA is a membership-based, non-profit organization dedicated to promoting the sport of rowing and boating safety for community members of all ages and abilities.

The boat dock and gangway were constructed within the vicinity of occupied eelgrass (*Zostera marina*) habitat and the gangway portion of the boating facility likely caused adverse impacts to eelgrass beds. The 2002 Initial Study for temporary/seasonal installation of the dock and gangway described a “narrow band of eelgrass that parallels the shore.” The HBRA gangway was, therefore, required to be constructed of grating material to allow filtration of light to the eelgrass beds below and was to be removed during the peak growing season. Currently, the gangway crosses over a disrupted band of eelgrass that parallels the shoreline. The gap in eelgrass beds under the gangway is assumed to be a result of gangway construction although no eelgrass mapping was conducted prior to construction of the gangway and photographs from 2002 are inconclusive as to the exact extent of eelgrass. The gangway shading appears to have had an adverse impact on approximately 156 ft² (14.5 m²) of the underlying eelgrass (see Appendix A – Figure 2 and Eelgrass Report W&K, 2010). This impact was likely exacerbated by the fact that, contrary to the 2002 conditions of project approval, the gangway remained in place throughout the year from 2003 until the present. This allowed the shading to occur through the peak of the growing season, when, according to 2002 permit conditions, the structure should have been removed.

This mitigation plan has been prepared in support of a Section 10 Permit from the U.S. Army Corps of Engineers (COE) and Coastal Development Permits from the City of Eureka and California Coastal Commission. In compensation for the assumed loss of eelgrass beds resulting from gangway shading, the HBRA proposes on-site replanting of eelgrass within suitable on-site unshaded habitat. The plan was prepared pursuant to the National Marine Fisheries Service (NMFS) Southern California Eelgrass Mitigation Policy (1991) with California Department of Fish and Game (DFG) and NMFS recommended adaptations for Humboldt Bay, and will result in a replacement ratio of at least 1.2:1.

PROJECT DESCRIPTION

Location

The HBRA facility is located within and adjacent to Humboldt Bay at 1535 Waterfront Drive in Eureka, CA; APN 002-241-013,-006. The project is located within split local/appeal and primary state Coastal Zone jurisdiction. The seaward portion of the project is within COE Section 10 jurisdiction.

Responsible Parties

The HBRA, as the lessee of the project site and owner of the gangway and dock, is the responsible party for implementation of this mitigation plan.

Proposed Project

The HBRA requests approval to convert the use of the existing floating dock and gangway from seasonal to non-seasonal/year-round structures. No additional structures or improvements are proposed, but the existing structures would simply remain in place throughout the year and would not be subject to seasonal removal. Structures would remain in place until the HBRA (as lessee) or the City of Eureka Redevelopment Agency (as lessor) terminates the lease of the site. Upon such termination, the HBRA will be required to remove all portions of the floating dock and gangway from Humboldt Bay, pursuant to the terms of the lease.

EELGRASS IMPACT

Impact Background

The HBRA project was constructed within the vicinity of occupied eelgrass (*Zostera marina*) habitat, which is Essential Fish Habitat (EFH) for various federally managed fish species. The EFH designation identifies fish habitats that are determined to be rare, especially ecologically important, highly susceptible to human-induced degradation, or are located in an environmentally-stressed area. Eelgrass vegetated areas are recognized as important ecological communities in shallow bays and estuaries because of their multiple biological and physical values. Eelgrass habitat functions as an important structural environment for resident bay and estuarine species, offering both predation refuge and a food source. Eelgrass functions as a nursery area for many commercially and recreational important finfish and shellfish species, including those that are resident within bays and estuaries, as well as oceanic species that enter estuaries to breed or spawn. Eelgrass also provides a unique habitat that supports a high diversity of non-commercially important species whose ecological roles are less well understood.

The 2002 Initial Study for temporary/seasonal installation of the dock and gangway described a “narrow band of eelgrass that parallels the shore.” The placement of structures that shade eelgrass is known to cause adverse impacts. The HBRA gangway was, therefore, required to be constructed of grating to allow filtration of light to the eelgrass beds below and was to be removed during the peak growing season. Currently, the gangway portion of the HBRA facility crosses over a disrupted band of eelgrass that parallels the shoreline. The impact area was measured to be approximately 156 ft² (14.5 m²) in October 2010 and would be re-surveyed in July 2011, prior to mitigation implementation.

There is no record of eelgrass vegetation located under the floating dock, where the substrate is likely too deep to support an eelgrass population.

Impact Assessment

Installation of the gangway appears to have caused indirect, long-term impacts related to shading the eelgrass beds below. Because eelgrass surveys were not conducted at the site in 2002 and photographic documentation is not sufficient to determine extent of eelgrass coverage, eelgrass is assumed to have been present under the gangway within the “narrow band” prior to placement of the gangway. Although the gangway was constructed of grating which allows some light to

penetrate to the water below, there is now a gap in eelgrass beds below the gangway where shading has occurred. This gap was measured to be approximately 156 ft² (14.5 m²) in October 2010, near the end of the growing season. The gangway shading impact on the eelgrass was likely exacerbated by the fact that, contrary to the 2002 conditions of project approval, the dock and gangway remained in place throughout the year from 2003 until the present. This allowed the shading to occur through the peak of the growing season, when, according to permit conditions, the structure should have been removed.

The area of impact will be re-surveyed at the lowest daylight tide in July 2011 to establish a final impact area.

MITIGATION

Mitigation Background

This mitigation plan is based on the National Marine Fisheries Service (NMFS) Southern California Eelgrass Mitigation Policy (1991) with adaptations for Humboldt Bay as recommended by DFG and NMFS during development of the plan. The Southern California Policy requires mitigation of impacts to eelgrass beds at a ratio of 1.2:1. The 156 ft² (14.5 m²) impact would, therefore, require approximately 188 ft² (17.5 m²) of mitigation to be completed pursuant to NMFS protocol for eelgrass mitigation. The 2010 eelgrass survey identified two regions of potential suitable, but unoccupied eelgrass habitat in the immediate vicinity of the HBRA facility (see Appendix A - Figure 2, and Eelgrass Report W&K, 2010). These areas total approximately 200 ft² (18.6 m²) and appear to have favorable conditions for completing on-site eelgrass mitigation under NMFS protocol, as discussed below.

Mitigation Re-Survey July 2011

The impact area and proposed mitigation sites shall be re-surveyed at the lowest daylight tide in July 2011, to confirm impact area, target mitigation density, and to ensure that the mitigation site is adequate in size. The survey shall be conducted pursuant to DFG recommendations and shall include six to nine 0.1 m² quadrats. The survey shall use a randomized sample design to place quadrats at the project site. The results of the pre-mitigation survey shall be approved verbally by the DFG and NMFS prior to issuance of the DFG letter of permission (LOP) and prior to implementation of this mitigation plan. Written results of the survey will be presented in the post-mitigation monitoring report (see Mitigation Monitoring, below).

Mitigation Map

See Appendix A Figure 2 – Eelgrass Location Map. Protocol for mapping follows NMFS format. A pre-mitigation map will be produced during the pre-mitigation survey and submitted to DFG, NMFS, the City of Eureka, and the Coastal Commission with the results of the post-implementation survey.

Mitigation Site

The 2010 eelgrass survey identified two regions of suitable, but unoccupied eelgrass habitat in

immediate vicinity of the HBRA facility (Appendix A - Figure 2). These areas total approximately 200 ft² (18.6 m²) and appear to have favorable conditions for completing on-site eelgrass mitigation under NMFS protocol. The proposed mitigation sites shall be re-surveyed at the lowest daylight tide in July 2011, to confirm the target density and to ensure that the mitigation site is adequate in size.

Mitigation Size

As discussed above, the proposed mitigation sites shall be re-surveyed at the lowest daylight tide in July 2011, to ensure that the mitigation site is adequate in size.

Each square foot of adversely impacted eelgrass bed will be replaced with at least 1.2 square feet of transplanted eelgrass in a suitable habitat. Based on 2010 survey data, the mapped impact area is approximately 156 ft² (14.5 m²) and the proposed mitigation area would be approximately 188 ft² (17.5 m²). The area to be transplanted will be larger than the required final mitigation target size to allow for a small degree of eelgrass mortality to increase the likelihood of achieving the final mitigation ratio of 1.2:1.

Mitigation Technique

Harvest from Donor Site: The proposed donor site is the adjacent occupied eelgrass beds identified during the Eelgrass Report, or other suitable site approved by DFG and NMFS prior to harvest. Techniques for the construction and planting of the eelgrass mitigation site shall be consistent with the best available technology at the time of the project. Written permission to harvest donor plants must be obtained from DFG. Harvest will be completed by first removing substrate from around the rhizome, then uprooting the rhizome with roots and blades attached. This method creates minimum disturbance to surrounding eelgrass and substrate. No more than 10 percent of an existing bed shall be harvested for transplanting purposes. Plants harvested shall be taken in a manner to thin an existing bed without leaving any noticeable bare areas.

Transplanting: Transplanting will be conducted pursuant to the terms of the DFG LOP to be completed prior to conducting any work in the donor or mitigation site. The following basic methods developed for Southern California eelgrass mitigation may be modified by the DFG LOP or, with written or oral notice to the HBRA, may be modified at any time by DFG or NMFS during mitigation implementation:

Not more than two days prior to transplanting, eelgrass will be harvested from the donor site using the bare-root method. The bare-root material will be processed into planting units of four shoots interlaced and attached directly to a degradable six-inch landscape anchor using degradable fasteners. Following anchor attachment, the leaves of each planting unit will be cut to a length of approximately 30 cm to facilitate handling and planting (Merkel, 2004). Planting units will be placed in seawater coolers following preparation. Planting units will be installed by hand excavating a hole approximately equal to the size of the unit, and inserting the planting unit into the hole so that the rhizomes are at a depth of approximately 2 inches below the substrate. The hole will be back-filled with substrate. Leaf blades will be pulled free of the substrate and stood upright from the bottom.

Spacing of transplant units shall duplicate the spacing of shoots within adjacent beds that were not impacted by shading. The average eelgrass turion density within undisturbed portions of the “narrow eelgrass band” in 2010 was determined to be approximately 1.56 turions/ft² (16.79 turions/m²). The adjacent eelgrass beds shall be re-surveyed at the lowest daylight tide in July

2011, to re-establish the target density and to ensure that the mitigation site is adequate in size. Density and mitigation area results from the July 2011 survey shall be approved by the DFG and NMFS prior to mitigation implementation.

Transplanting activities shall be conducted during the eelgrass growing season (May through September), after DFG/NMFS approval of July 2011 survey results, final mitigation parameters are approved by DFG and NMFS, and the DFG LOP is issued.

Mitigation Timing

Mitigation will begin upon receipt of state, federal, and local permits and authorizations (including DFG LOP for eelgrass harvest) for the project. All work shall be conducted within the eelgrass growing season from May through September.

Mitigation Monitoring

Monitoring the success of eelgrass mitigation shall be required for a period of five years from the time of transplanting. Monitoring activities shall determine the area of eelgrass and density of plants at the transplant site using six to nine 0.1 square meter quadrats. The monitoring survey shall use a randomized sample design to place quadrats at the project site. Monitoring will be conducted immediately after transplanting and again at the end of the growing season (preferably in September). Yearly monitoring will then be conducted during the anniversary month of transplanting from 2012-2016.

Additional monitoring beyond the fifth year may be required if the density or distribution of the mitigation site does not meet success criteria. To account for any natural changes or fluctuations in bed width or density, monitoring of the adjacent undisturbed eelgrass beds as control area will occur as part of each monitoring event. Monitoring reports shall be provided to the resource agencies within 30 days after the completion of each required monitoring period and shall include the summary sheet (Appendix B) included in NMFS Southern California Eelgrass Mitigation Policy.

Mitigation Success

Criteria for determination of transplant success shall be based upon the minimum required mitigation area and target density (to be established as noted in Mitigation Size and Mitigation Technique, above), as follows:

- a. The mitigation site shall achieve a minimum of 70 percent of the minimum area of eelgrass and 30 percent of target density in the initial year.
- b. The mitigation site shall achieve a minimum of 85 percent of the minimum area of eelgrass and 70 percent of target density in the second year.
- c. The mitigation site shall achieve 100 percent of the minimum area of eelgrass and 85 percent of target density in the third, fourth and fifth years.

Should the required eelgrass transplant fail to meet any of the established criteria, then a Supplementary Transplant Area (STA) shall be constructed and planted pursuant to the recommendations of DFG and NMFS.

NOTIFICATION

Monitoring Reports

Monitoring reports completed pursuant to Mitigation Monitoring, above, shall be provided to the Distribution List within 30 days after the completion of each required monitoring period and shall include the NMFS Southern California Eelgrass Mitigation Policy Monitoring and Compliance Reporting Summary sheet (Appendix B). The initial monitoring report shall include the results of the pre-mitigation survey, including: target mitigation density, impact area, size of mitigation receiver sites, density sample results, and an updated map. The first monitoring report will also include: a detailed description of methods were used for transplanting, photographs of the site at low tide with eelgrass exposed prior to transplanting, similar photographs of the site once transplanting is completed (if possible at the end of the day on the day of transplanting). Subsequent annual monitoring reports shall also contain photographs of the mitigation site at low tide with eelgrass exposed.

Notification of Completion

If Mitigation Success criteria have been met upon completion of the final specified monitoring event, Notice of Completion shall be forwarded along with the final Monitoring Report to the Distribution List below and the Mitigation Plan shall be complete. Should the required eelgrass transplant fail to meet any of the established criteria, then a Supplementary Transplant Area (STA) shall be constructed and planted pursuant requirements of DFG and NMFS. Monitoring, success, reporting, and completion requirements for any STA will generally follow the same requirements as the original mitigation effort.

Distribution List

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REFERENCES

Fonseca, M.S., W.J. Kenworthy, and G.W. Thayer. 1998. Guidelines for the conservation and restoration of seagrass in the United States and adjacent waters. NOAA COP/Decision Analysis Series 12. 222 pp.

Merkel, K.W. 2004. Experimental Eelgrass Transplant Program. Investigations for On-site Eelgrass Mitigation. Final Report to California Department of Transportation.

National Marine Fisheries Service (NMFS). 1991 Southern California Eelgrass Mitigation Policy.

Winzler & Kelly, 2010. Eelgrass Survey. November, 2010.

Appendix B
NMFS Reporting Form