

MEMORANDUM

DATE: April 6, 2016

TO: Joe Brogan, Foster Pepper, PLLC

FROM: Jon Houghton, PhD

RE: **Potential Effects of Removal of New Shoreline Protection on Runstad Property on Blakely Island**
17921-00

S.J.C. DEPARTMENT OF
APR 13 2016
COMMUNITY DEVELOPMENT

This technical memorandum was prepared by Jon Houghton, PhD, a professional marine biologist with more than 40 years of experience in the field of nearshore marine biology in the Pacific Northwest. In accordance with SJCC 18.35.130(G)(3)(f)(vii) the qualifications of Jon Houghton meet the San Juan County definition of a “qualified professional”.

During the winter of 2010–2011, following a period of heavy rain and shoreline erosion, a section of shoreline was hardened (the Project) along the Runstad property on Blakely Island, Washington, without a Hydraulic Project Approval (HPA) or San Juan County Shorelines permit. The landowner is currently seeking an after-the-fact exemption determination or a Shorelines Substantial Development Permit that would allow the bulkhead to remain in place.

This memo evaluates the potential adverse effects to both short-term and long-term ecological resources should all or a portion of the Project be removed. This discussion is based in part on the associated memo (G. Horvitz 2016) discussing geotechnical implications of Project removal.

Ecological Effects of Project Removal

To assess the potential effects of removing all or a portion of the Project, we must first describe the beach as it now exists, approximately five years after Project construction in the winter of 2010–2011. During construction, heavy equipment was operated on the beach to excavate a trench along the toe of the slope in which to place the foundation rocks that ensure the structural stability of the Project. Also, an apron of quarry spalls was placed on the upper beach to the west end of the Project to facilitate equipment access to the beach. Equipment operation in the intertidal zone likely caused considerable short-term disturbance of substrates and the limited epibiota and infauna that exist on the middle to upper beach at this location. At the time of our first low-tide site visit (January 2013), evidence of beach disturbance had largely disappeared. Wave and tidal action had resorted beach sediments into gradients



that appeared natural for a beach of this slope and exposure. A few remaining quarry spalls noted on the western portion of the beach were removed shortly thereafter.

During multiple low tide visits to the site in 2013–2015, the beach continued to exhibit natural features and seasonal changes similar to those expected on undisturbed beaches. In late summer 2013, we conducted a delineation of the ordinary high water (OHW) line on the site that showed the lower exposed rock of the newly constructed Project to be above OHW. This delineation and accompanying photographs are provided as Attachment 1 to this memorandum. Since construction, the accumulation of sediment, drift logs, and growth of vegetation on the limited backshore in front of the Project strongly indicate that the Project is having no ongoing adverse impact on the nature of the beach sediment and coastal processes of the beach.

Short-term Effects

Removing the Project would require the re-introduction of heavy equipment to the beach for a period of several weeks. A barge would need to be maneuvered into the bay and anchored on the beach to receive rock as it was lifted from the slope. Disturbance of the beach would likely be comparable to that of the initial project construction and considerable in local severity. Direct effects of removal could include crushing of epibiota and infauna in the upper part of the beach; loss of riparian vegetation and drift wood in the storm berm that has formed at and above OHW; and alteration of the upper beach substrate composition that reduces the suitability of the habitat for forage fish spawning. Disturbance of the beach would likely result in an increase in suspended sediment as waves in the flooding tide encountered disturbed beach materials. Increases in suspended sediment in the water along the beach could reduce feeding efficiency for small fish foraging along the shoreline and could reduce photosynthetic rates in algae in the mid and lower beach, and eelgrass at and below MLLW.

Additional damage would occur if the subsurface foundation rock for the Project, installed behind the OHW line at elevations below OHW, were also removed. This could destabilize the upper beach, leading to much greater suspension of sediment and greater effects on mid and lower beach biota.

Long-term Effects

As noted in the related geotechnical analysis, it could be expected that, without the Project in place, there would be substantially higher rates of shoreline erosion at the site in the long term. The exact nature and rates of this erosion cannot be accurately predicted and would depend in part on any measures enacted to stabilize the shoreline in the absence of the Project. In any case, it is certain that there would be increased sediment delivery to the beach; it is probable that these inputs would include episodic releases of large amounts of sediment as slope failures occurred and the scarp along the toe of the slope increased in height.



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Although sediment delivery to beaches is a naturally occurring process in many areas, and serves to replenish shoreline sediments lost to longshore transport or down-slope movement, there can be strong adverse effects on intertidal biota. These effects depend on the nature and rate of sediment delivery. The most extreme effect is burial and smothering that can result in reduced growth rates of both plants and animals; if not cleared by wave or current action, death can result. Lesser amounts of fine sediments can also clog feeding and respiratory organs of filter-feeding invertebrates and settle on plant surfaces (algae and eelgrass), reducing photosynthetic rates.

Attachment 1 – OHW Memorandum (11/08/13)