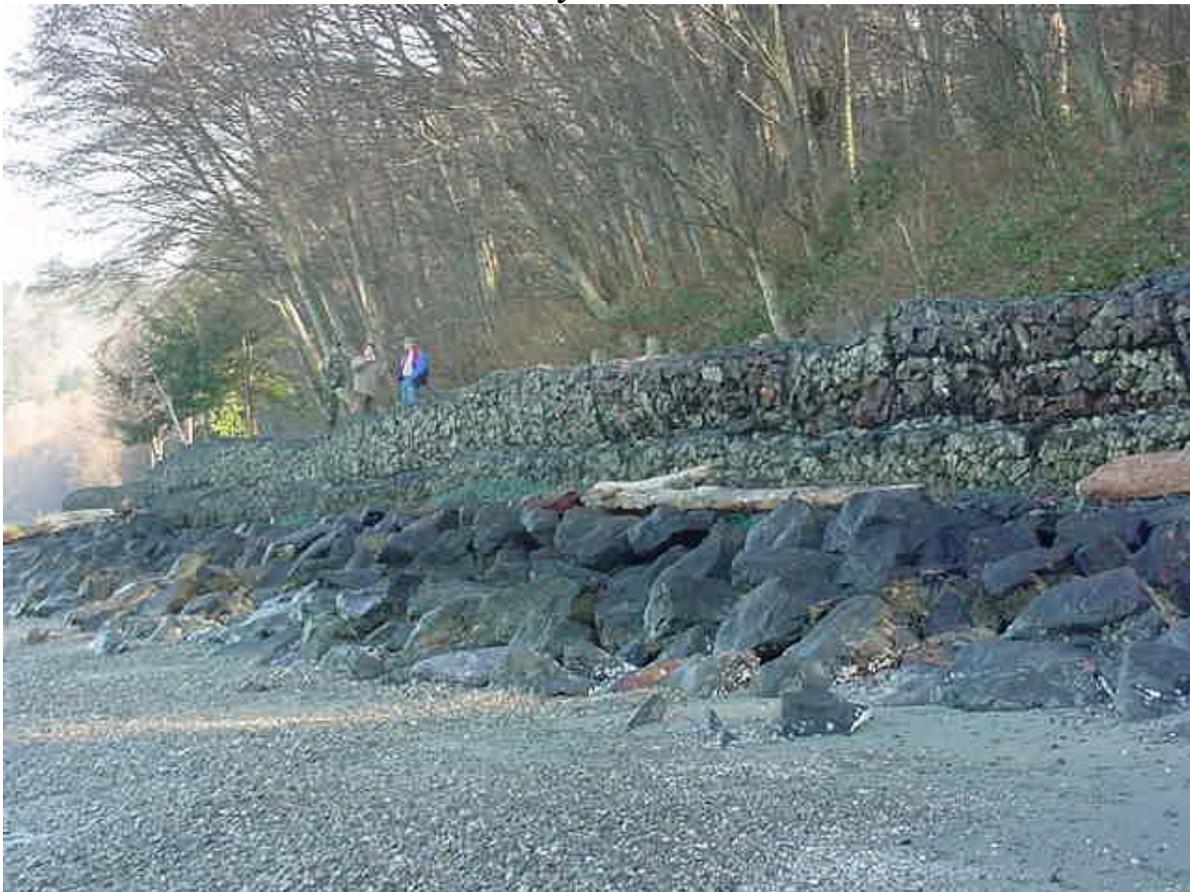


**DRAFT ENVIRONMENTAL ASSESSMENT**  
**for**  
**NEARSHORE RESTORATION**  
**at**  
**SEAHURST PARK, BURIEN, WASHINGTON**

*July 2003*



**US Army Corps  
of Engineers** ®  
Seattle District

**Seahurst Park Nearshore Restoration  
Burien, King County, Washington**

**Draft Environmental Assessment  
July 8, 2003**

**Responsible Agency:** The responsible agency for this project is the Seattle District, U.S. Army Corps of Engineers (Corps).

**Abstract:** The United States (U.S.) Army Corps of Engineers (Corps) proposes the removal of approximately 3110 cubic yards (CY) of gabion and toe stone and 5085 cy of path fill material in the form of the existing gabion and fill structure located between elevations +18 and +9 feet MLLW. All material not designated for reuse within the project area will be removed by barge and taken to an approved upland disposal site. When structural and intertidal rock removal is completed, approximately 4000 cy of washed coarse gravel (2.5 inch to 3/4 inch) will be used to create an underlying beach surface on a 5:1 slope from the backshore between +14' MLLW and +5' MLLW. A second layer of fine gravel and coarse sand containing particle widths between 1mm and 8mm (approximately 5000 CY) will be placed on a 6:1 slope to mimic reference beach surface substrates. Final grading will be conducted by wave action and is expected to be approximately 7:1. All existing and available woody debris found at the site will be replaced in the backshore. Dunegrass and upland plantings will occur following construction by the City of Burien. Much of the construction is tide dependant and will require approximately one month to complete. Actual work will take approximately 2 weeks. The work is currently scheduled for early fall of 2003 (October).

THE OFFICIAL COMMENT PERIOD ON THIS DRAFT ENVIRONMENTAL ASSESSMENT IS JULY 8 TO AUGUST 8, 2003.

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BE:	Biological Evaluation
BMP:	Best Management Practices
CFR:	Code of Federal Regulations
Corps:	U.S. Army Corps of Engineers
DPS:	Distinct Population Segment
EFH:	Essential Fish Habitat
ESA:	Endangered Species Act
ESU:	Evolutionarily Significant Unit
FWCA:	Fish and Wildlife Coordination Act
MLLW:	Mean Lower Low Water
MHHW:	Mean Higher High Water
NEPA:	National Environmental Policy Act
NMFS:	National Marine Fisheries Service
USC:	United States Code
USFWS:	U.S. Fish and Wildlife Service

## 1.0 INTRODUCTION

The United States (U.S.) Army Corps of Engineers (Corps) proposes the removal of approximately 3110 cubic yards (CY) of gabion and toe stone and 5085 cy of path fill material in the form of an existing gabion and fill structure located between elevations +18' and +9.0' MLLW. When structural and intertidal rock removal is completed, approximately 4000 cy of washed coarse gravel (2.5 inch to 3/4 inch) will be used to create an underlying beach surface on a 5:1 slope from the backshore between +14' MLLW and +5.0' MLLW. A second layer of fine gravel and coarse sand containing particle widths between 1mm and 8mm (approximately 5350 CY) will be placed at approximately a 6:1 slope to mimic reference beach surface substrates. Vegetative plantings will be incorporated to control erosion, increase diversity and discourage invasive plants. In accordance with the National Environmental Policy Act (NEPA), this document examines the potential impacts of the proposed beach re-nourishment.

## 2.0 BACKGROUND

### 2.1 Project Location

The project area is located along the beach on the east shore of East Passage, Puget Sound, within the City of Burien, King County, Washington (SE¼, Section 13, Township 23 North, Range 3 East, Willamette Meridian). Seahurst Park is a wooded 153-acre park located on the shoreline of Puget Sound. The park was transferred from King County to the City of Burien upon its incorporation in 1972. The park is used for community recreation and includes beach access, picnic structures, educational features and walking paths.

### 2.2 Project History

The City of Burien and the Corps of Engineers are investigating restoration alternatives for the Seahurst Park property located on the eastern shore of Puget Sound (Figure 1 and 2). The City of Burien has maintained the park property as a recreational feature for the citizens of Burien. As such, simple roadways and footpaths have been developed to serve as access throughout the project site. On the north side of the park, a large promenade has been constructed along with several administrative and educational buildings. Along the southern length of the park, a 10-foot wide footpath lies on top of a gabion, rock and fill structure located within the upper intertidal zone of Puget Sound (Figure 3). Upslope of the structure is a steep and active hillside colonized by a mix of deciduous and coniferous trees and mostly native understory. A small unnamed tributary (WRIA Trib.0367) flows generally westward through a small and high gradient watershed before entering the park property and into Puget Sound. The restoration objectives are to provide uninhibited nearshore function with respect to sediment transport, woody debris recruitment, marine fish transportation and forage fish spawning. Wildlife objectives include enhanced tributary function and improved shoreline function. Heavy urbanization of central Puget Sound has greatly reduced areas where nearshore function has been allowed to function unimpeded. As such, opportunities to restore nearshore function in an area adjacent to natural habitat are very rare.

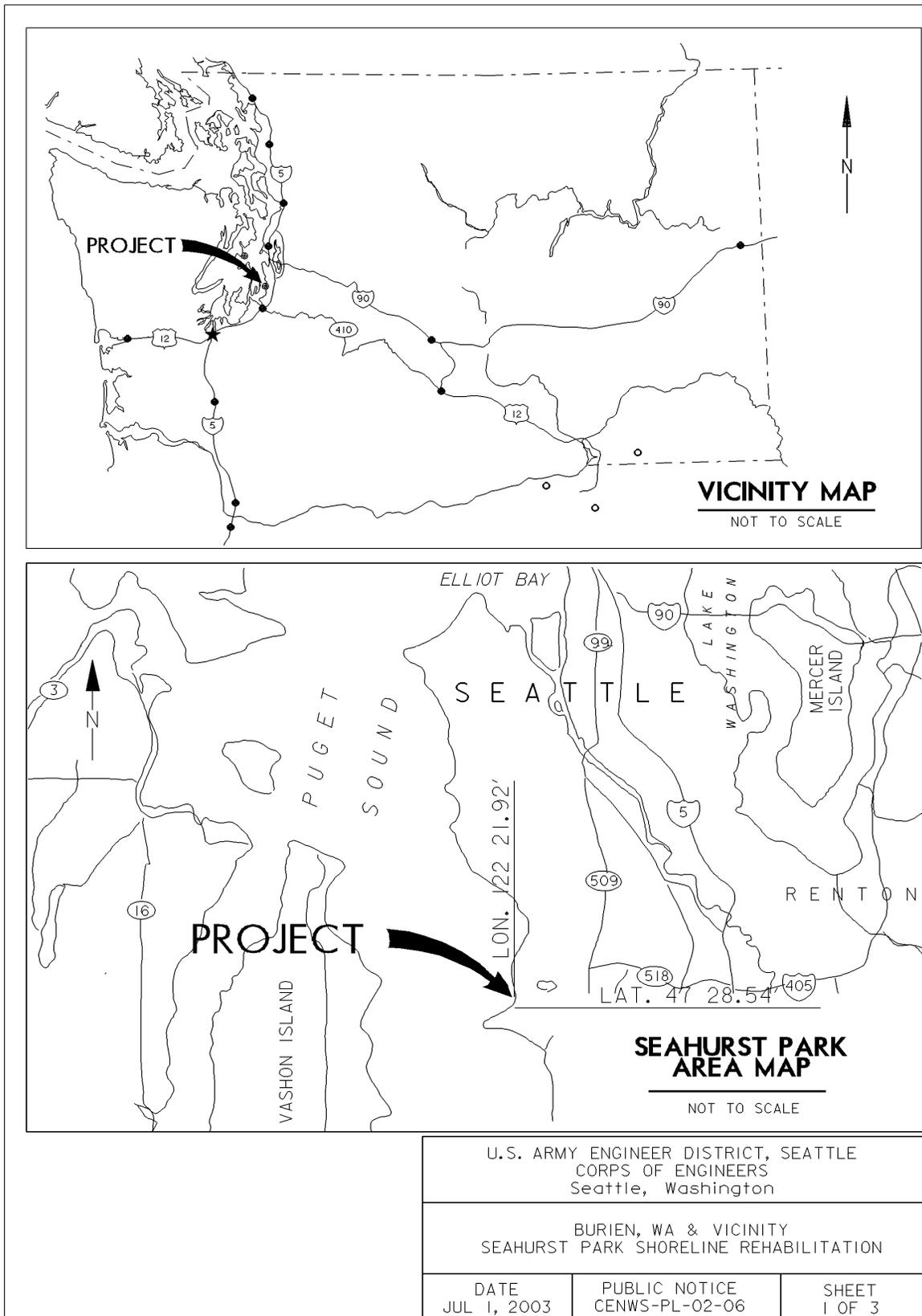


Figure 1. Seahurst Park Vicinity Map.

The City of Burien will require this restoration project to be in close coordination with the Seahurst Park Master Plan development, which was adopted by the City Council in the summer of fiscal year 2002. In addition, the public nature of the site will require additional public outreach and education to ensure acceptance of the proposed alternatives. Outreach may include discussions on proper amounts of public use and structures to facilitate access. Future plans for the park include upgrades to the marine science laboratory located at the north end of the park and future trail work in the uplands of the southern park. These components are not part of this proposed project and are not included in this evaluation.



Figure 2. Aerial Photograph of Project Site.

### 2.3 Project Authority

The proposed project is authorized under Section 206 of the Water Resources Development Act of 1996 as amended, and the City of Burien Seahurst Park Master Plan 2002. The Section 206 authority includes restoration of aquatic resources subject to local sponsor cost sharing, support from the local sponsor and environmental acceptability.

### 2.4 Need and Purpose

King County, the former owner and developer of the park, armored the shoreline of Seahurst Park in the early 1970's. The result of this armoring of the shoreline has been to increase the erosive energy of waves moving sediment northward along the beach or into deeper water. At the same time these seawalls have isolated the beach from one of its primary sources of sediment, the steep bluffs above the park. The results have been a dramatic drop in the beach elevation of approximately three to four feet over the past 30 years, plus a degradation of the

beach as a habitat for salmon, and the species they depend on. Of particular concern and interest are two species of forage fish, sand lance (*Ammodytes hexapterus*) and surf smelt (*Hypomesus pretiosus*), that are both critical food resources for salmon. These two fish species depend on upper intertidal sandy/fine gravel beaches for spawning. Seahurst Park has been identified by the Washington Department of Fish and Wildlife as spawning habitat for both forage fish species (WDFW, 1978).

### 2.5 Restoration Goals and Objectives

The primary goal for habitat restoration is:

*To reconnect the hillside and intertidal zones, restoring conditions and activating physical (geologic) and biological processes that support juvenile salmon and forage fish.*

To achieve this goal several objectives need to be met. The objectives include:

- 1) Remove existing shoreline protection structures, such as bulkheads and rock revetments, where they cause the most harm, and where it is compatible with the Master Plan approach for future use of the park.
- 2) Model restored beach slopes and substrates after reference conditions found nearby. Replenish gravel and sand lost to erosion (since the park was developed) with suitable imported and on-site materials.
- 3) Restore and protect the natural delivery paths of sediment, particularly sand and gravel, to the beach.
- 4) Protect and restore native vegetation that overhangs the water and provides nearshore riparian ecological functions.

## **3.0 DESCRIPTION OF PROPOSED PROJECT**

### Removal, Disposal, Salvage and Re-use of Existing Materials:

The proposed project consists of removing approximately 3110 CY of gabion and toe stone and 5085 CY of path fill material in the form of an existing gabion and fill structure located between elevations +18' and +9.0' MLLW. Rock and fill removal will be conducted by hydraulic excavator. Approximately 835 CY of armor and gabion rock will be stockpiled by the City of Burien on an upland site for future trail building and landscaping uses. The Corps conducted soils analysis of the existing path fill between stations 0+00 and 14+00. It was found that the path fill between stations 9+00 and 14+00 is composed of mixed gravel and sand materials suitable for re-use as a portion (14%, 700 CY) of the coarse sand/gravel surface layer of the restored beach. The remaining 4735 CY of path fill and armor and gabion rock will be placed on a barge for transportation to an upland disposal facility. A small hydraulic excavator would remove drift logs and stockpile them for re-use on the restored beach backshore along with any trees removed during construction. The ordinary high water mark at Seahurst Park (MHHW) is considered to be +11.66 ft above Mean Lower Low Water (MLLW).

Removal of material unsuitable for replacement on the beach or being stockpiled for later upland uses will be loaded onto a barge and taken to an approved upland disposal site. This operation

will require a temporary loading ramp be constructed at the project site to facilitate safe loading of the barge by trucks. This ramp will be constructed of rock and fill and be removed when barge operations are complete. Location of the temporary loading ramp will be located in an area that minimizes impact to beach resources. Only one ramp will be constructed.

Prior to placement of beach materials for reestablishment of beach profile and function, angular armor and gabion rock exposed on the surface of the intertidal beach with a diameter of 10 inches or greater will be removed between elevations +9.0' MLLW and +2.0' MLLW. This material is below the elevation of the intact gabions and armor rock. An excavator will walk the beach and remove the rocks prior to placement of beach substrates. Any rock or unsuitable material remaining on the beach from the temporary loading ramp will be removed at that time.

#### Imported Materials:

When structural and intertidal rock removal is completed, approximately 4000 cy of washed coarse gravel (2.5 inch to 3/4 inch) will be used to create an underlying beach surface on a 5:1 slope from the backshore between +14' MLLW and +5.0' MLLW (Appendix E). A conveyor located on an offshore barge and work platform will place the gravels. The gravels will be roughly graded by excavator or small bulldozer in preparation for further overlays of material and to ensure longevity of the beach backshore elevation

A second, surface layer of mixed gravel and sand material will be placed over the washed coarse gravel. The second layer will be approximately 5350 CY (350 CY on-site re-used material mentioned above, and 5000 CY imported material) of fine gravel and coarse sand that includes particle widths between 1mm and 8mm. This material is designed to mimic reference beach surface substrates south of the project limits and provide forage fish spawning habitat. The material will be placed on a 6:1 slope between elevations +15' MLLW and +4.0' MLLW. The material will cover any exposed coarse gravel and fill any remaining areas of low elevation caused by the equipment. The material will be placed between the same stations as earlier substrate placements (Stations 4+25 and 14+00). A barge mounted conveyer would conduct the substrate placement throughout the placement elevations. Material unloaded from the barge would be left to wave and tidal action for final sorting which is expected to sort material to a final grade of 7:1. A barge would deliver all equipment and materials to the work area and construction activity would be confined to the project footprint.

Logs and other backshore habitat features removed prior to gabion excavation and stockpiled on-site will then be replaced along the project backshore along with any other trees removed as part of project construction.

#### Vegetation

Bluff soils exposed during the excavation of the gabion and fill structure will be sloped between 2:1 and 3:1 and covered with approximately 6" of topsoil in preparation for plantings. Within the first few months post construction, most plantings will be for erosion control. Additional vegetation will be planted in early spring using native shrubs and trees for the purpose of increasing diversity and managing invasive species. The planting will be conducted by the City of Burien. In addition, native dunegrass will be planted along the far backshore of the project

location. Dunegrass already exists in some locations. Planting of dunegrass will occur in the spring following construction to ensure winter storm events do not damage the plants.

#### Future Trail Restoration (by City of Burien)

A trail system that would restore access to the restored beach will be pursued by the City of Burien. The trail restoration will include features to minimize impacts and facilitate beach restoration such as moving the trail landward, and eliminating the south 120 linear feet of trail. The trail will remain above MHHW, and above the beach backshore. Two small drainage streams will be reconnected to the beach. Trail construction and maintenance are an integral part of project sustainability by allowing connectivity of upland material and debris to the backshore (Appendix F).

#### Timing

By restricting site access and project footprints and construction time, disruptions to aquatic biota will be minimal. Construction is anticipated between the months of September and October 2003, to coincide with environmental work windows and lower park use. This period allows for avoidance of all environmental windows except for forage fish spawning. Much of the construction is tide dependant and will require approximately one month to complete. Actual work will take approximately 2 weeks.

#### 3.1 Conservation Measures

Several measures will be employed during construction to minimize adverse project effects on the environment. The Contractor shall ensure that construction personnel recognize and understand relevant aspects of the conservation measures and any other such conditions as might be stated within environmental management plans, BMP's or permits. Copies of all such documents should be onsite and available for review by contract personnel.

- All work would be completed between 1 September and October 31. The work window avoids sensitive migration periods for salmonids, the bald eagle nesting period, and the bald eagle wintering period. Much of the construction is tide dependant and will require approximately one month to complete. Actual work will take approximately 2 weeks.
- No part of any beached barge may rest on the bottom below an elevation of -2 feet (mean lower low water or MLLW) for the protection of eelgrass.
- Transportation of material between the beach and the barge must be carried out within a clearly marked 50-foot-wide access zone. The access zone shall remain unchanged throughout construction.
- The north and south boundary of construction shall be clearly delineated and all equipment shall remain within these limits throughout the project.
- Any necessary grading of beach fill will be conducted in the dry during periods of low tide.
- Earth moving equipment shall remain landward of the toe of the beach fill at all times except to retrieve non-native angular rock in the lower intertidal zone.

- Washing of material from barges or placement of fill by hydraulic means is prohibited.
- All beach logs moved during construction shall be immediately replaced after placement of the beach substrate.

## 4.0 OTHER ALTERNATIVES CONSIDERED

### 4.1 No Action

Under the “No Action Alternative,” gabion, rock and fill removal would not take place. No additional substrate would be placed at Seahurst Park. Damage to existing gabion structure would continue and the beach conditions, over time, would continue to be degraded and net shore drift impeded. The beach would gradually steepen and the area and value of intertidal habitat reduced as a result. Maintenance costs to repair the gabion structure and trail would increase over time. Upslope wasting events (landslides) will also continue to be a maintenance issue for the City of Burien. Intertidal habitat loss would continue through lack of material normally provided by littoral drift. The “No Action Alternative” would not meet the need and purpose of the project, the local sponsors or the environment.

### 4.2 Place beach nourishment material seaward of gabions

Under this alternative, beach material of a composition similar to areas found updrift would be placed in front of the gabion structures to recreate appropriate grain size and slope characteristics. In many areas around Puget Sound, planners have looked towards placing beach nourishment in front of hardened structures to mimic natural processes and although the success of these measures varies, the concept appears to return some natural function to degraded beaches for varying lengths of time. The beach bluffs updrift of the project site would be relied upon to continue feeding the placement site and contribute to its longevity.

Benefits from this alternative should be seen in improved juvenile salmonid habitat as well as increased invertebrate production. Forage fish spawning is a potential benefit so long as sediment longevity and wave action doesn't preclude spawning success. Tributary conditions would remain unchanged although the placement of nourishment may contribute to sediment aggregation at the tributary mouth since it is located downdrift of the placement site. Vegetation benefits would be minimal, as recruitment to the nearshore of woody debris would be restricted by the gabion structure. Wildlife would benefit slightly as the nearshore environment becomes more productive and more accessible in the short term. Over the long term the nourishment material would be moved along the littoral drift cell and the beach would return to its preproject composition. The gabion structure would remain an impediment to upper intertidal production and upland connectivity. The existence of the gabion structure and armor rocks would continue to compromise the sustainability and benefit of the material placed waterward. Benefits from the nourishment would be temporary, ignore backshore benefits and would require costly renourishment actions over time. Accordingly, this alternative will not be considered further.

### 4.3 Removal of Gabions

Under this alternative, all armor and gabion structures and non-native fill would be removed and the hillside allowed to be influenced by beach processes. No additional material would be

provided to enhance native beach substrate or slope. Undeveloped slopes south of the park boundary would serve to provide additional material to the beach. Under this alternative, the Corps would remove existing shoreline protection structures and fill present along the southern portions of the park. Removal would include all areas where the structure influences nearshore processes (as determined by vegetation and beach debris). Estimated length of gabion removal is approximately 1200 feet. Existing slopes behind the gabion structure would be allowed natural access to high tides with no substitute erosion control provided. The presence of the gabion structures has caused a lowering of the beach face approximately 3.5' which has limit compromised both slope and sediment conditions (City of Burien, 2002). Without incorporation of additional beach grade material after removal of the intertidal structures, the intertidal zone will continue to be limited in it's backshore development because of the lowered and steepened beach profile. Benefits to the backshore and benthic communities would not be assured without proper beach profiles. The natural littoral drift and upland contributions are believed sufficient to sustain the profiles but may not be adequate to build the beach. Accordingly, this alternative will not be considered further.

## 5.0 EXISTING CONDITIONS

### 5.1 Physical Characteristics

Seahurst Park is a heavily wooded and intensely landscaped park consisting of three distinct geographic areas: uplands, steep bluffs, and gently sloping beaches (see Figure 2). Park facilities include jogging and interpretive footpaths, picnic shelters, parking lots, restrooms, and an easily accessible saltwater beach. The southern trail system, extending towards the south boundary is of particular prominence. The gabion structure is a two or three tier structure bolstered by large angular armor rock in its middle sections. A loosely paved trail is present on top of the gabion structure approximately 8-10 feet wide. The beach below the structure and armor rock is a gentle 1:7 slope consisting of a variety of substrate types from sands to boulder. According to the Seahurst Park Master Plan Appendix B, the southern park shoreline may have lowered as much as 3.5 ft in response to the gabion structure (Seahurst Park Master Plan 2002). The hillsides above the gabion structure are unstable, exhibit signs of active creep and are subject to frequent but shallow landslides. The net movement of material along the beach (littoral drift) is from south to north. The project area is at the head of a long drift cell with the zone of divergence located immediately to the north of Seahurst Park. A small delta of sand has formed to the north where the small creek enters Puget Sound. There is an accumulation of woody debris and logs at the delta and sporadically along the southern gabion structure.

#### *5.1.1 Water Quality*

Little quantitative water quality information exists for the project site, but quantitative baseline water quality parameters can be estimated based on the habitat conditions of the parklands and the tributary watershed. Freshwater water quality parameters that most directly influence fish, invertebrate, and vegetation production at the site include compounds and elements from urban runoff, turbidity from upland disturbances, highly variable flows from urban development, temperature impacts from canopy removal, upland disturbances and to some extent, dissolved oxygen. Marine water quality parameters of interest are primarily from toxic chemicals from ship traffic or upland releases.

The small drainage area of the tributary basin and the urban nature of the upper drainage make it probable that some impairment of water quality could be occurring in the tributary. Elevated concentrations of turbidity, petrochemical inputs, pesticides, fecal coliform or other common compounds found in suburban regions may be found. Dissolved oxygen impairment is possible as it relates to turbidity and temperature, but is not likely to be a limiting factor in itself. Highly variable flows from modifications to the drainage area of the tributary can cause excessive high flow from rain events and also reduce summer low flows.

Water quality in East Passage is generally good, particularly considering the urban nature of the Seattle shoreline. Seahurst Park was found to have a lower incidence of elevated fecal coliform levels than other nearby marine parks (King County 1996). There may be remnant hydrocarbon deposits from past development activities or seeps of unknown contamination as well as small discharges from vehicles. There are currently no known areas of contamination above action levels on the project site.

#### *5.1.2 Soils*

Although USDA soil characterizations did not include the project site, inferences made from surveys conducted further south which classified soils in the Des Moines area as belonging to the Alderwood Association described as a moderately well drained, undulating to hilly soil with dense, very slowly permeable glacial till at depth of 30-40 inches, on uplands and terraces. The steep nature of the hillside above the project area probably lends itself to characteristics described under the very steep Alderwood and Kitsap soils (AkF) which are described as about 50 percent Alderwood gravelly sandy loam and 25 percent Kitsap silt loam. Slopes under this characterization are 25 to 70 percent. Drainage and permeability are said to vary with rapid to very rapid runoff and a severe erosion hazard. The slippage potential is severe as well. Soils are best used for timber. The gabion structure marks a transition between the steep hillside and the beach which is comprised of medium and small gravels and some cobbles with a sandy component found in the voids between larger material (Figure 3). Updrift of the gabion structure, the substrate appears finer with smaller gravel and a larger and more visible coarse sand component (Figure 4).



Figure 3. Substrate in front of gabions



Figure 4. Native substrate updrift of gabion

### *5.1.3 Wetland Vegetation*

While there are areas that appear to be capable of supporting a wetland community, the heavy use of the project area by human visitors and the heavy vegetative maintenance of the park have effectively kept them from forming. There is a potential area for wetland development within a flat depression adjacent to the tributary. Some small wetland pockets and seeps may exist on the

forested hillside associated with small depressions and local drainage. Top of bluff development and surrounding infrastructure may have decreased the amount of runoff to the bluff. This may have reduced the number and diversity of any wetlands as well as had an affect on the volume of freshwater influencing the beach.

#### *5.1.4 Upland Vegetation*

The project area lies at the bottom of a high and actively creeping hillside and is colonized by a mixed coniferous and forest community (Figure 5). Although some areas of the hillside have remained stable, periodic slumps and failures have occurred over much of the area and are likely to continue. The overstory community on this hillside is typical of a second or third rotational forest and characterized by stands of alder and maple with scattered individuals of cedar and fir. The unstable nature of the hillside likely represents a condition of consistent disruption where mature coniferous forests are unlikely to develop. The understory vegetation is dominated by salmonberry but also includes sword fern, vine maple. Invasive plant species such as holly, Boston ivy, laurel and blackberry have found footholds within the hillside.

In the flat areas of the project area, there are sparse stands of alder and maple and a grass dominated understory. Grasses are also found where the gabions structures give relief between the beach waves and uplands.



Figure 5. Upland hillside vegetation and evidence of slope movement.

## 5.2 Natural Resources

### 5.2.1 Macroalgae and Marine Seagrasses

Eelgrass (*Zostera marina*) beds are present just offshore and north of the project area and in shallow waters all along the Puget Sound shoreline of Seattle. The eelgrass distribution along the southern shoreline is highly irregular with some large, dense patches and other areas of sparse colonization. Large patches of eelgrass typically start at around the -2 ft MLLW line except for between stations 3+50 and 5+75 where it begins around +2.0' MLLW.

A reconnaissance survey of the intertidal zone was completed in summer of 2002 during a low tide of -2 feet (mean lower low water or MLLW). Large stretches of eelgrass were located along the project at elevations at or below MLLW were observed and began between 100 and 200 feet seaward of the existing gabion structure. The eelgrass patches included both *Zostera marina* and *Zostera japonica* with *Z. marina* generally occurring at lower elevations.

A variety of algal species occur in the project area but most of the colonization occurs in the lower intertidal elevations (below +6.0' MLLW). At lower elevations, the substrate changes to cobble. *Ulva* and *Enteromorpha* dominate the zone between about +6.0' and -2.0' (MLLW). Between +2.0' and -2.0' (MLLW) and lower, a mix of *Laminaria* and *Iridea*, can be found among the substrate. No *Macrocystis* or *Nereosystis* was found off the project area (Table 1).

Table 1. Seaweeds found at Seahurst Park. Adapted from King County, 1995-1996.

Green (Chlorophyceae)	Brown (Phaeophyceae)	Red (Rhodophyceae)
Cladophora seriaceae	Fucus distichus	Ceramium pacificum
Enteromorpha intestinalis	Punctaria hesperia	Cryptosiphonia woodii
Enteromorpha linza	Pylaiella littoralis	Gelidium sinicola
Navicula sp.	Ralfsia sp.	Gelidium coulteri
Ulva fenestrata	Sargassum muticum	Gigartina exasperata
		Mastocarpus papillatus
		Polysiphonia collinsii
		Porphyra sp.
		Smithora naiadum

### 5.2.2 Fish

Seahurst Park is located along the shores of Puget Sound and can be expected to support populations of nearshore marine fishes and serve as an important migration corridor for

migratory marine fishes such as salmon. The freshwater tributary likely supports small populations of resident fishes and perhaps coho salmon. The beach substrate may be suitable in places for spawning by marine forage fish such as sandlance and surf smelt. The freshwater influence of the tributary on the nearshore serves as an important holding area and nursery area for juvenile flatfish, perch and invertebrates important to juvenile salmon growth. Marine macrophytes (eelgrass, green algae, brown algae) important to nearshore productivity and juvenile salmon are likely to occur offshore between the subtidal and mid-intertidal zones. In those same elevations, other invertebrates including sea cucumbers, moon snails bivalves and other mollusks can be expected. Other marine organisms also frequent the sand/gravel beaches of the project site. Gunnels, flatfish, sculpins, shiner and surf perches all frequent the intertidal ranges. In the subtidal elevations of the project area, cabezon, lingcod and dogfish shark can be found in search of crab, octopus, bivalves, small forage fish and other prey items.

Between February and July, juvenile anadromous salmon outmigrate from their natal streams and move along the nearshore in search of food and protection. The nearshore environment is critically important to the survival of these juvenile salmon between the time they emerge from the mouth of their natal stream and the time they leave Puget Sound. The closest large sources of salmon outmigrants to the project area are the Puyallup River to the South and the Duwamish River to the North. Both these systems along with small creek populations along the shoreline provide a consistent source of juvenile salmon to the project site. Salmon migrants would be comprised predominantly of chinook, coho and sea-run cutthroat trout. Chum, sockeye, steelhead and bull trout may also pass along the project shoreline. Adult salmon migrating back to freshwater to spawn would also pass along the project area. Although spawning by salmon hasn't been documented recently in tributary 0367, cutthroat and coho could successfully spawn in the lower reaches of the tributary if the tributary was accessible.

Many marine fishes utilize the nearshore for feeding, spawning and migration. Of particular importance to the project site are sandlance and surf smelt, which commonly spawn in the mid to upper intertidal ranges on beach substrates of coarse sands and small gravel. Spawning can occur year round but is most common between the months of October and April. The park was identified in some earlier forage fish spawning work and suitable beach gravels for forage fish spawning can be found but no egg sampling has been done recently to confirm spawning. Other marine fishes such as shiner perch, flatfishes, herring and sculpins use the nearshore and intertidal elevations for feeding and protection from predators. All these fishes benefit from uninhibited access to upper intertidal habitats.

The park has several small freshwater springs and seeps along the project area. There is one tributary of note within the project boundary. The tributary appears to be fed primarily by small seeps and runoff from the uplands above the bluff. The small basin which gives rise to the tributary is influenced greatly by upland development and frequent perturbations by hillside instability and highly variable flows. It is even possible that resident fish have been extirpated at some point by a number of physical and geomorphic disruptions. For migratory fishes, the tributary does hold some promise for smaller salmonids that can take advantage of smaller coastal tributaries such as coho salmon. However, coho spawning in the tributary has not been recently documented. Outplanting of juvenile coho or rainbow trout may occur yearly in the

creek as part of local school efforts or associated with the marine technology center located at the park.

If coho were to utilize the tributary, they would return within the months of October and November and complete spawning by January. Cutthroat trout would typically spawn in early spring between February and March but possibly through the month of June.

### 5.2.3 Wildlife

Wildlife of the project area includes various large and small mammals and many bird species. Red-tailed hawks and other raptors have been seen perching within the project area. Small songbirds inhabit the upland hillsides and floodplain. Dabbling ducks, geese, seaducks and gulls often fly past and occasionally land in the park. Piscivorous birds such as cormorants, grebes, loons, mergansers, and great blue herons and bivalve eating birds such as scoters and goldeneye may use the beach as feeding areas. Shorebirds also frequent the project area as they probe into the substrate, or sweep the shallow water with their bills for invertebrate prey. Coyotes and fox may occasionally visit the park as they hunt voles, rabbits and other small mammals up on the hill or scavenging for carrion on the beach. Furbearers such as raccoon, mink, opossum and others also forage along the beach and hillside. The creek also acts as a corridor for fox and many wildlife species, which travel up and down the drainage. Deer and other large game animals have been generally denied access from the project area as a result of urban development and infrastructure in the surrounding areas. Although not documented as a critical haulout or feeding area, resident pinnipeds, and cetaceans can occasionally be seen passing offshore of the project area.

### 5.2.4 Invertebrates

The Seahurst Park intertidal area provides habitat for a variety of mollusks including butter clams (*Saxidomus sp.*), littleneck clams (*Protothaca staminea*), macoma clams (*Macoma spp.*), and common cockle (*Clinocardium nuttalli*); and crabs including Dungeness crabs (*Cancer magister*) and red rock crab (*Cancer productus*). The Washington State Department of Health advises against shellfish harvest on any beach on the eastern shore of Puget Sound between Everett and Tacoma although sporadic shellfish harvesting does occur at Seahurst Park. A King County beach assessment report indicated a clam band covered about 3.5 acres with most clams found on the along the southern beach. King County found macoma clams comprised about half of the clams found in the 1996/1997 and the littlenecks 19%. By weight, the littlenecks comprised about half of the biomass and macomas comprised about 25%. Heavy human disturbance of the beach was noted. The clams found at Seahurst Park were scarce and very small; 188 clams weighed about 1.2 grams each. The density estimate of 8 clams per square foot was the second lowest of the surveyed beaches, yielding about 9.2 grams per square foot the lowest yield of all of the beaches surveyed. Of the eight manila clams, 36 littleneck clams and 37 butter clams collected at Seahurst Park in 1996/1997, none were of legal size. The manila, littleneck, butter, macoma and softshell clams and the cockles were all smaller than the averages for all beaches combined. Most recently, the University of Washington research on invertebrate assemblages at Seahurst Park comparing modified with unmodified stretches of shoreline. The study concluded shoreline armoring decreases abundance and taxa richness in both benthic and infaunal invertebrate and insect assemblages and the impacts are most profound in cases where the modifications are installed below MHHW such as at Seahurst Park (Sobocinski 2003).

SCALE monitoring by the Washington Dept of Natural Resources and University of Washington indicates the greatest diversity of Seahurst Park invertebrates occur below upper intertidal elevations perhaps peaking around the +0.0' MLLW mark (Dethier pers. comm. 2003)

Other invertebrates were noted during a beach assessment program conducted by King County in 1995 and 1996. They recorded limpets (*Acamaea sp.*), snails (*Litorina sp*, *Searlesia Direa sp.*, and *Thais sp.*), Sea Stars (*Evasterias troschelli*), Barnacles (*Balanus sp.*, *Chthanalus dalli*), Crabs (*Hemigrapsus sp.*, *Lophopanopeus bellus*, *Cancer sp.*, *Pugettia producta* and *Telmessus cheiragonus*). Isopods (*Idotea sp*), amphipod (*Caprella kennerlyi*) and both segmented (*Thelepus crispus*) and tube worms (*eudistylia polymorpha*) were found.

5.2.5 Sensitive, Threatened and Endangered Species.

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Several species protected under the Act are potentially found in Puget Sound in the Greater Seattle area (Table 2).

Table 2. ESA Protected Species Potentially Occurring in the Project Vicinity

Species	Listing Status	Critical Habitat
Bald Eagle <i>Haliaeetus leucocephalus</i>	Threatened	—
Marbled Murrelet <i>Brachyramphus marmoratus</i>	Threatened	Designated
Coastal/Puget Sound Bull Trout <i>Salvelinus confluentus</i>	Threatened	—
Puget Sound Chinook Salmon <i>Oncorhynchus tshawytscha</i>	Threatened	—
Steller Sea Lion <i>Eumetopias jubatus</i>	Threatened	Designated
Humpback Whale <i>Megaptera novaeangliae</i>	Endangered	—
Leatherback Sea Turtle <i>Dermochelys coriacea</i>	Endangered	Designated
Puget Sound/Strait of Georgia Coho Salmon <i>Oncorhynchus kisutch</i>	Candidate	—

5.3 Native American and Cultural Resources Sites

The project area beaches were used by Native Americans for summer clam digging and fishing (McDonald and Whitney 1997). There are documented cultural resource sites within the Seahurst Park boundaries. Communications with archeologists and the State Historic Preservation Office have ensured the proposed project will avoid all disturbances to known sites. Soil disturbances as part of this project would occur entirely on top of fill placed originally in the 1970's or 1990's.

#### 5.4 Land Use

Park visitors intensively utilize the project area for a variety of recreational activities (see Paragraph 5.5). Surrounding land uses are primarily single family residential and open space.

#### 5.5 Recreation

Within the general boundaries of Seahurst Park amenities include picnic shelters, the pedestrian walkway/promenade, restrooms, and trails leading up the bluff that overlooks Puget Sound. Heaviest use occurs from late spring to fall, but small numbers of people use the park year round.

## 6.0 EFFECTS OF THE PROPOSED ACTION

### 6.1 Physical Characteristics

The removal of the gabion structure and relocation of associated trails will result in a change in current erosion patterns at the south end of Seahurst Park. Wave protection at the toe of the bluff afforded by the gabion structure and armor rock will be eliminated, allowing access to the bluffs by wave action. This would occur at extreme high tides and likely increase local erosion at the base of the bluff. Erosion rates however are not likely to increase substantially. The rate of loss and the subsequent occurrence of landslides appear to be driven by upslope instabilities rather than toe erosion (City of Burien 2002). Littoral drift of material is likely to be restored with removal of the gabion structure and placement of beach material. It is unlikely that the substrate placement at Seahurst Park will affect alluvial dynamics at the creek mouth.

### 6.2 Water Quality

Substrate placed on the beach after gabion removal will be free from any pollutants or contamination. Some increased turbidity would likely occur for one or two high tides following placement, but the effects of the turbidity are expected to be minimal due to their localized and temporary nature. Material placed for beach restoration will be sorted from clean materials and free of excessive fines. Waves, tides, and currents would likely rapidly disperse any resultant turbidity. During construction, equipment operating on the beach would work in the dry and would be inspected daily for leaks or petroleum contamination prior to commencing work. Barge operations have been planned such that prop disturbance to sediments is minimized through a reduction of barge movements and a single material loading site. A spill prevention control and containment plan designed to reduce the impacts from potential spills (fuel, hydraulic fluid, etc) would be in place prior to the start of construction. Accordingly, impacts to water quality parameters are expected to be minimal.

### 6.3 Noise and Air Quality

Noise and air quality impacts in the immediate area of the construction may occur but will be minor and temporary. Noise and air quality disturbances from the construction, primarily from construction equipment, will not occur at levels considered a significant impact to fish and wildlife resources. The construction noise and air quality disturbances will not cause direct mortality, latent mortality or other physiological damage. Behavioral avoidance of the project area by wildlife is not anticipated.

During construction, there will be a temporary and localized reduction in air quality due to emissions from earthmoving equipment and dump trucks operating during soil excavation and

disposal activities. These emissions will not exceed EPA's de minimis threshold levels (100 tons/year for carbon monoxide and 50 tons/year for ozone) or affect the implementation of Washington's Clean Air Act implementation plan. Significant impacts are not anticipated.

Wildlife resources, particularly birds and small mammals are most likely to be temporarily impacted by noise and air quality degradations. While coyote and fox may frequent the area, large mammal use in the project area is limited by extensive human presence and other existing sources of disturbance. Birds including raptors may also be temporarily affected by noise and additional human disturbance. Air quality may be affected locally by large equipment activities but will not significantly affect fish and wildlife resources.

### 6.3 Natural Resources

#### *6.3.1 Macroalgae and SeaGrasses*

Long term investigations of eelgrass and macroalgae abundance or distribution have not been undertaken at the project site. Recently, a reconnaissance level survey of eelgrass presence was conducted to provide insight into spatial constraints and likelihood of impacts from project construction.

Beach material placed under this proposal is expected to be placed and finish graded by tides between elevations +15 feet and +4.0' MLLW with a strong placement bias towards the upper elevations. Eelgrass beds offshore of the project area lie between +2.0' MLLW and approximately -2.0 feet (MLLW). Bull kelp was not seen during the survey but may be present under the surface at bottom elevations between -6.0 and -15 feet (MLLW). No eelgrass or kelp occurs in the project footprint. The barge is not expected to ground fully on the bottom as it delivers beach material.

During construction, a barge would be stationed at the beach to remove fill and rock material for upland disposal. Construction would be timed during the fall to coincide with relatively calm weather and high daytime tides that would allow the barge to access staging areas in the high intertidal or supratidal zone with no grounding in eelgrass or kelp beds. A temporary loading ramp will be provided to facilitate barge loading. A second barge may be provided upon completion of fill removal (or near completion) to deliver gravel directly to the beach with a conveyor belt. The barge off loading material would not rest on the bottom below an elevation of -2 feet (MLLW) and would be positioned to avoid any grounding on eelgrass.

Construction activities would likely disturb the upper edge of the intertidal zone where *Ulva* were observed in summer of 2002. Substantial impacts to eelgrass are not anticipated due to extremely low eelgrass density in the immediate work zone and minimized need for tug movement and resultant prop wash. Any impacts to algae would be temporary and expected to recovery quickly. Results of the project impacts on eelgrass from construction will be identified through monitoring (Appendix A). The community dynamics of the algal species in the area should not be affected by the proposed project. Post construction, material placed to restore the intertidal beach profiles are expected to move along the littoral drift cell and not downslope into elevations occupied by eelgrass.

### 6.3.2 Fish

Juvenile salmonids utilize the shoreline of Seahurst Park for feeding and refuge from predators. [Nearby monitoring of the beach at Lincoln Park following initial construction found that the overall density of important salmonid prey items along the disturbed beach was similar to a control beach (Pentec 1993)]. By burying the existing beach surface, the proposed work would temporarily decrease populations of epibenthic organisms within the project footprint. Potential adverse effects would be minimal, as the work would occur in the fall as epibenthic production seasonally decreases and the project footprint represents only a small proportion of the available foraging habitat in the vicinity. Any dip in epibenthic abundance would be short-term. Peak abundance of juvenile salmonids at the project site occurs in the spring allowing for partial recovery of epibenthic communities. Adult salmon may occur in the vicinity of the project when the work would occur but these fish are larger and not as directly dependent upon the upper intertidal nearshore environment.

The proposed construction would occur just prior to the peak of the migration of adult coho salmon returning to nearby creeks and rivers. Although adult coho may orient along the shoreline during their migration, they are not specifically dependent upon the nearshore during migration. Coho may stage near the creek prior to their terminal migration but the project is likely too far from the nearest utilized creek mouth to be considered an important staging area. In-water disturbance during construction would be minimal.

Sand lance and surf smelt are thought to spawn on beaches located within the general project area. The forage fish prefer areas of finer gravels and sand substrate than those found in front of the gabion structure. A main purpose for providing additional substrate following removal of the gabion structure is to provide forage fish spawning habitat. The limited amount of habitat presently available will be covered with new beach material. Adverse effects to other marine fish are not anticipated as the work will occur at high tidal elevations (higher than +6.0' MLLW) and the disturbance would be temporary.

### 6.3.3 Wildlife

The proposed construction would slightly increase activity over ambient levels. Some displacement of birds may occur. Due to the small size of the project, construction disturbance would be limited in size and duration. Birds moving from the vicinity of the project would not be displaced from locally important habitat. The completed project would not change habitat features important to bird life. Overall, adverse impacts to birds are not anticipated as a result of the proposed work.

### 6.3.4 Invertebrates

Monitoring following the 1988 beach nourishment at nearby Lincoln Park found no effect on shellfish resources from nearshore substrate placement (Antrim *et al.* 1993). The proposed work at Seahurst Park would be much smaller in scope and should not represent long term effects to shellfish occurring in the vicinity. Some discrete and isolated short-term impacts from direct coverage may occur at the upper intertidal elevations as nourishment is placed. Recolonization is expected to occur rapidly. Shellfish populations at Seahurst park appear to be highly degraded due to harvest and heavy human intertidal use.

Some degree of invertebrate impact is likely from removal of the non-native angular rock in the mid intertidal elevations above +1.0' MLLW. Close examination of the rocks shows colonization by snails, limpets, shore crabs, hermit crabs, anemone, polychaete worms, gunnels, starfish and other organisms not commonly found in the sand and eelgrass communities of Seahurst Park. When removed, organisms attached to or reliant upon the rock substrate between the elevations affected will be displaced from the intertidal zone. The large quantity of rocks remaining below +1.0' MLLW will be undisturbed. The transition from rock to sand in the upper intertidal is necessary for full function of the mid and upper intertidal elevations.

#### *6.3.5 Sensitive, Threatened and Endangered Species.*

There is an active eagle nest approximately .25 miles from the project area. Due to the small size of the project, the timing and short duration of construction, and the restorative nature of the project, we have concluded that the project is not likely to adversely affect bald eagles, marbled murrelets, bull trout, chinook salmon, and Steller sea lions. To avoid adverse effects to these species, construction would occur between the months of September and October. Additional conservation measures taken to avoid impacts to salmonids and eagles include management of the construction barge to avoid grounding, allowing work during daylight hours only, and replacement of all beach logs removed during construction. A biological evaluation has been completed that contains more details about the project's potential effects on threatened, endangered, and sensitive species. A summarization of the analysis and affects determinations of the BE show the following:

##### *Bald Eagle*

The proposed project **may affect, but is not likely to adversely affect** the bald eagle since eagles may be present in the action area but the work period is short, the construction activities are relatively minor, the work would occur outside of sensitive nesting and wintering periods, and the finished project would not alter the forage opportunities or other eagle habitat compared to current conditions.

##### *Marbled Murrelet*

Since construction activities would have no effect on nesting habitat or the murrelet food base, and the effects of any noise disturbance during construction are expected to be insignificant, the proposed project will have **no affect** on the marbled murrelet. The project would have **no effect** on designated critical habitat for this murrelets since no critical habitat is located near the project.

##### *Steller Sea Lion*

This project will have **no affect** on the Steller sea lion since the potential for significant sound disturbance or impacts to water quality and prey abundance are highly unlikely and discountable. The project would have **no effect** on designated critical habitat for this species.

##### *Humpback Whale and Leatherback Sea Turtle.*

The likelihood that a humpback whale or leatherback sea turtle would occur along the eastern shore of East Passage, particularly in the shallow nearshore area where work would occur, is extremely low. Given their distribution, the Corps has determined that the proposed project would have **no effect** on these species or designated critical habitat of leatherback sea turtle.

### *Bull Trout*

The proposed project **may affect, but is not likely to adversely affect** Puget Sound/Coastal bull trout. This determination is made based upon the limited scope and duration of the project, the low likelihood that bull trout would be present in the action area during construction, and the temporary and minor nature of project impacts.

### *Chinook Salmon*

The proposed project **may affect, but is not likely to adversely affect** Puget Sound chinook. This determination is made based upon the limited scope and duration of the project, the low likelihood that chinook would be present in the action area during construction, and the temporary and minor nature of project impacts.

### 6.4 Vegetation.

Upland vegetation will not be impacted significantly however some trimming or removal may be necessary to provide equipment access. All disturbed areas will be replanted with native plants in keeping with park goals and to increase plant diversity, reduce disturbance and improve water quality. Some park sponsored revegetation of the backshore may occur shortly after project completion as an early phase of the City of Burien's upland trail reconstruction.

### 6.5 Native American and Cultural Resources Sites

No vehicle, equipment, staging or other direct or indirect disturbances are planned in close proximity to any known sites. Direct soil disturbances as part of this project would occur entirely on top of fill placed originally in the 1970's. Beach substrate placement on the existing beach profile would not result in loss or damage of any unknown cultural resources sites. The work would not adversely affect salmonid populations or impair fishing sites reserved by treaties for Native American use. Although Native Americans historically used the area for collection of shellfish and for fishing, the tribes do not currently use Seahurst Park directly for such purposes.

### 6.6 Land Use

During construction, public access to a portion of the Seahurst Park shoreline under construction would be restricted. Construction would take place during the fall when park use is relatively low. After construction, use of land in the vicinity would be relatively unaffected by the new beach and substrate. The proposed project would not affect land use in areas adjacent to the project area, including nearby residential properties.

### 6.7 Recreation

The project would occur during low use months at Seahurst Park. Also, during the fall, most visitors to Seahurst Park utilize the upland areas, rather than the shoreline. Given the timing, short duration of construction, and small size of the project, substantial impacts to recreation are not anticipated during the construction period. After construction, recreational use and access to the park and shoreline would be similar to before construction except citizens will now be able to walk directly on the beach rather than above the beach on the old trail. Future trail construction by the City of Burien will reestablish upland access to less citizens. Some walkways or other points will be provided for park users to access the beach but all such structures will remain above MHHW.

## 7.0 CUMULATIVE EFFECTS

The National Environmental Policy Act (NEPA) defines cumulative effects as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR §1508.7).

The passing of the Seahurst Park Master Plan by the City of Burien City Council institutes a series of potential changes that could be concluded as occurring in the foreseeable future. These actions are designed to improve park utilization and are not inconsistent with the intent of the proposed project. The actions proposed at the southern beach are specifically mentioned in the Master Plan such that future work should not degrade restoration work. Actions which may add cumulative environmental impacts from the proposed project or adversely affect restoration benefits are minimal.

Although the southern beach will receive substrate to restore slope and provide additional beach spawning habitat, future re-nourishment by the City of Burien may be provided. The proposed project is not intended as a long term nourishment program but unforeseen weather events or extended beach recovery periods may require additional material be placed at Seahurst Park. In this event, temporary environmental impacts associated with material transport, placement and nearshore colonization may add cumulatively to the affects of the restoration project. Some temporal impacts to invertebrates and algae will be associated with additional nourishment. Upland trail construction and additional pedestrian use may be a foreseeable event should the south beach become more heavily utilized following the proposed project. These trails would be designed to be consistent with the master plan that strives to avoid adverse impacts to homeowner, wetland and aesthetic values. The proposed project has been designed to control and minimize adverse use of the south beach by pedestrians by providing for formal access points and trails. No other cumulative impacts are anticipated.

## 8.0 TREATY RIGHTS

In the mid-1850's, the United States entered into treaties with a number of Indian tribes in Washington. These treaties guaranteed the signatory tribes the right to "take fish at usual and accustomed grounds and stations . . . in common with all citizens of the territory" [*U.S. v. Washington*, 384 F. Supp. 312 at 332 (WDWA 1974)]. In *U.S. v. Washington*, 384 F. Supp. 312 at 343 – 344, the court also found that the Treaty tribes had the right to take up to 50 percent of the harvestable anadromous fish runs passing through those grounds, as needed to provide them with a moderate standard of living (Fair Share). Over the years, the courts have held that this right comprehends certain subsidiary rights, such as access to their "usual and accustomed" fishing grounds. More than *de minimis* impacts to access to usual and accustomed fishing area violates this treaty right [*Northwest Sea Farms v. Wynn*, F. Supp. 931 F. Supp. 1515 at 1522 (WDWA 1996)]. In *U.S. v. Washington*, 759 F.2d 1353 (9<sup>th</sup> Cir 1985) the court indicated that the obligation to prevent degradation of the fish habitat would be determined on a case-by-case basis. The Ninth Circuit has held that this right also encompasses the right to take shellfish [*U.S. v. Washington*, 135 F.3d 618 (9<sup>th</sup> Cir 1998)].

The proposed project has been analyzed with respect to its effects on the treaty rights described above. We anticipate that:

- The work will not interfere with access to usual and accustomed fishing grounds or with fishing activities or shellfish harvesting;
- The work will not cause the degradation of fish runs and habitat; and
- The work will not impair the tribes' ability to meet moderate living needs.

## 9.0 IRRETRIEVABLE AND IRREVERSIBLE COMMITMENTS OF RESOURCES

No federal resources would be irreversibly and irretrievably committed to the proposed action until this Environmental Assessment is finalized and a "Finding of No Significant Impact" or "Record of Decision" has been signed.

## 10.0 ENVIRONMENTAL COMPLIANCE

### 10.1 National Environmental Policy Act

Section 1500.11 and 1508.9(1) of the National Environmental Policy Act of 1969 (as amended) requires federal agencies to "provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact" on actions authorized, funded, or carried out by the federal government to insure such actions adequately address "environmental consequences, and take actions that protect, restore, and enhance the environment". This assessment evaluates environmental consequences from the proposed placement of substrate along the shoreline of Seahurst Park at Burien, Washington.

### 10.2 Endangered Species Act

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. The potential effects of the project and conservation measures taken to reduce those effects are addressed in more detail in Paragraphs 5.2.5, 6.3.5, and the BE for the project. Both the USFWS and NMFS will be consulted prior to final design and construction. The results of this consultation will be incorporated into a final Environmental Assessment (EA) and other pertinent documents.

### 10.3 Clean Water Act Compliance

The proposed work was evaluated pursuant to Section 404(b)(1) of the Clean Water Act in accordance with the guidelines promulgated by the Environmental Protection Agency (40 CFR 230) for evaluation of the discharge of dredged or fill material into waters of the United States. In addition, consideration has been given to the need for the work, and to such water quality standards as are appropriate and applicable by law. The proposed discharge represents the least environmentally damaging practicable alternative and would include all appropriate and practicable measures to minimize adverse effects on the aquatic environment. The work would not result in the unacceptable degradation of the aquatic environment. The proposed action represents the least environmentally damaging, practicable alternative. The discharges and

methods specified in the proposed work are in accordance with the Section 404(b)(1) guidelines (see Appendix C).

#### 10.4 Fish and Wildlife Coordination Act

The U.S. Fish and Wildlife Coordination Act (FWCA, 16 USC 470) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. This goal is accomplished through Corps funding of USFWS habitat surveys evaluating the likely impacts of proposed actions, which provide the basis for recommendations for avoiding or minimizing such impacts. Formal reporting requirements of the FWCA are not applicable for small restoration projects although the USFWS will be solicited for input during planning and review specifications.

#### 10.5 Essential Fish Habitat

In accordance with the Essential Fish Habitat (EFH) requirements of the Magnuson-Stevens Fishery Conservation and Management Act, the Corps has determined that the proposed work would impact approximately 6 acres of EFH utilized by Pacific salmon, groundfish, and coastal pelagic species. We have determined that the proposed action would not adversely affect EFH for federally managed fisheries in Washington waters. The BE for the project provides supporting documentation for our determination. The Corps is consulting with the NMFS to include conservation measures adequate to avoid, minimize, or otherwise offset adverse impacts to EFH.

#### 10.6 National Historic Preservation Act

The National Historic Preservation Act (16 USC 470) requires that the effects of proposed actions on sites, buildings, structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. The project proposes no work on documented sites. However, since there have been sites found within the Park boundaries, an archeologist will be onsite during construction to ensure there is no chance for disturbance.

#### 10.7 Clean Air Act

The proposed project has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. The proposed activities would not exceed *de minimis* levels of direct emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons, a conformity determination is not required for this project.

#### 10.8 Environmental Justice

Executive Order 12898 directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low income populations. No tribal resources would be harmed. No adverse effects to minority or low income populations would result from the implementation of the proposed project.

## 11.0 CONCLUSIONS.

Based on the above analysis, this project is not a major Federal action significantly affecting the quality of the human or natural environment, and therefore does not require preparation of an environmental impact statement.

## 12.0 REFERENCES

- Antrim, L.D., R.M. Thom, and W.W. Gardiner. 1993. Lincoln Park shoreline erosion control project: monitoring for surface substrate, infaunal bivalves, and eelgrass, 1993. Prepared for the Seattle District, U.S. Army Corps of Engineers. PNL-8822. Battelle Marine Sciences Laboratory, Sequim, Washington.
- City of Burien. 2002. Seahurst Park Master Plan. Prepared by Anchor Environmental for City of Burien, Burien, Washington
- Dethier, M. Personal Communication. 28 June 2003.
- King County. 1996. Data Summary, 1996 Marine Report.  
<http://dnr.metrokc.gov/wlr/waterres/marine/datasum.htm>; queried on 18 December 2002.
- McDonald, C.M. and S.R. Whitney. 1997. Nature walks in and around Seattle: All-season exploring in parks, forest, and wetlands. The Mountaineers.
- Pentec. 1993. Lincoln Park shoreline erosion control project: post construction monitoring of epibenthic zooplankton. Prepared for US Army Corps of Engineers, Seattle District, Seattle, Washington by Pentec Environmental, Inc., Edmonds, Washington.
- Puget Sound Water Quality Action Team. 2002. Puget Sound Update: Eighth report of the Puget Sound Ambient Monitoring Program. Puget Sound Water Quality Action Team. Olympia, Washington.
- Sobocinski, K. 2003. The impact of shoreline armoring on supratidal beach fauna of central Puget Sound. Masters of Science. School of Aquatic and Fishery Sciences. University of Washington, Seattle
- U.S. Army Corps of Engineers. 2001. Programmatic Biological Evaluation for the State of Washington for Salmonid Species Listed or Proposed By the National Marine Fisheries Service and U.S. Fish and Wildlife Service Under the Endangered Species Act. Seattle District, Regulatory Branch, Seattle, Washington.
- Washington Department of Fisheries. 1978. Studies of the surf smelt (*Hypomesus pretiosus*) in Puget Sound. Technical Report 42. Olympia, WA. 47pp.

# APPENDIX A

## Seahurst Park Monitoring Plan

**SEAHURST PARK  
NEARSHORE RESTORATION PROJECT  
BURIEN, WASHINGTON**

**DRAFT**

**ENVIRONMENTAL MONITORING PLAN**

July 2003

## 1.0 BACKGROUND

The Corps of Engineers and City of Burien are investigating the removal of an existing gabion and armor rock structure in the nearshore of Puget Sound. There is a need to establish a pre-project biological and physical baseline surveys to document conditions present prior to construction of the restoration project. The overall objective of this monitoring is to prepare the project for successful quantification of positive environmental change at the site. Investigations include implementation, and effectiveness monitoring of significant project features.

## 2.0 FIELD SURVEYS

Broken into physical and biological, the Corps of Engineers and City of Burien propose the following monitoring efforts for Seahurst Park. The proposed monitoring comprises the formal aspects of work although additional work may be added from outside sources as time and funds allow. Pre-construction monitoring is scheduled for late summer and early fall of 2003 with annual post construction monitoring proposed for the late fall of 2003 and continuing for a 5 year period (Table 1).

The project area is currently defined by approximately 1400 ft of shoreline along the southern end of Seahurst Park. The survey area includes approximately 500' of shoreline on either side of the project site that serves as a wider area of consideration for physical and biological responses to the restoration project.

### 2.1 Eelgrass Surveys

#### 2.1.1 *Pre-Construction (Baseline) Surveys*

**Goals:** There are 3 goals within this monitoring plan for pre-construction study of eelgrass.

1. Document lower intertidal and shallow subtidal distribution of eelgrass within the project area and reference areas.
2. Document turion density of eelgrass.
3. Obtain data on macrophytes

**Objectives/Tasks:** To meet the above goals, the following tasks will be conducted through a field transect survey and data reduction and analysis. Specific guidance on conducting the surveys at Seahurst Park shall follow those of the WDFW Intermediate Eelgrass/ Macroalgae Habitat Survey (WDFW 96). The intermediate eelgrass/macro algae habitat survey guidelines are applied in those instances where a proposed project is to be located within an area of documented eelgrass/macro algae habitats but where herring spawn has not been documented. The survey should be conducted by a qualified diver/biologist, approved through WDFW, capable of identifying predominant macroalgae species native to the project area. Intermediate surveys shall be conducted from June 1 through October 1. Depth contours established for the project site shall be based on mean lower low water equal to 0.00 feet (MLLW = 0.00 feet) with tidal reference and corrections noted.

Specific baseline survey methodologies for Seahurst Park include:

1. Identification of permanent survey transects perpendicular to the shoreline for baseline surveys. Transect length and location will be determined by project and site specifics but shall be located no further apart than 40' from one another. Transects will include the landward margin of the macro algae habitat and should extend waterward to include the outer margin of

the macro algae habitat. Transects will extend at least 250' from the existing gabion structure (baseline) or the -2.0' MLLW whichever is further.

Eelgrass, turion (shoot) counts shall be conducted along each transect at a maximum 20-foot interval and shall include the inner and outer margins of the eelgrass bed. Eelgrass density counts will include three (3) 1/4 meter square counts as described by the corner of the 1/4 meter square pivoted around the 20 foot interval count point at approximately the 2, 6, 10 o'clock positions. The density count at each 20 foot count interval will be the average of the three (3) 1/4 meter square counts. Shoot density at quadrates where eelgrass was clearly  $>30\text{shoots}/0.25\text{m}^2$  will be characterized as "Dense" and counts will not be conducted.

For non eelgrass macro algae species, percent cover estimates will be conducted along each transect at a maximum 20 foot interval and shall include the inner and outer margins of the macro algae habitat. Percent cover estimates will include three (3) 1/4 meter square estimates as described by the corner of the 1/4 meter square pivoted around the 20 foot interval count point at approximately the 2, 6, and 10 o'clock positions. The percent cover estimate will be the average of the three (3) 1/4 meter square estimates.

### ***2.1.2 Post-Construction (Monitoring) Surveys***

**Goals:** There are 4 goals within this monitoring plan for post-construction study of eelgrass.

1. Resurvey established eelgrass transects using methods from baseline monitoring (intermediate surveys)
2. Establish random transects and sampling strata
3. Document density or percent cover estimates of eelgrass within same random transects
4. Obtain data on macrophytes within same random transects.

**Objectives/Tasks:** Post project monitoring surveys shall follow WDFW guidelines applicable in those instances where statistical evaluation is deemed necessary such as Seahurst Park. The surveys will be conducted by a qualified diver/biologist able to identify the predominant macro algae species native to the project area. Post construction surveys shall be conducted using the same methodology employed during the baseline surveys; in this case the intermediate eelgrass survey methodology. In all, a total of 4 surveys shall be conducted (baseline survey + three post construction surveys). Each post-construction survey will be conducted between June 1 and October 1 with emphasis given towards the same month each year (July). The post-construction survey immediately after construction will occur after 1 October due to the anticipated construction schedule. All observations will be referenced to mean lower low water equal with tidal reference and corrections noted and identified by differential GPS for future mapping and repeatability purposes.

**Deliverables:** For each baseline and post-construction survey conducted, a site map will be developed indicating the qualitative distribution of eelgrass/macroalgae species, substrate characterization, approximate depth contours and the approximate location of the proposed project features. Additional data to be collected will include survey documentation including the time of survey, date of survey, turbidity/visibility, presence of invertebrate /vertebrate species and miscellaneous anecdotal observations pertinent to habitat characterization of the project site (wildlife use, LWD, etc).

Results of the intermediate level survey will be compiled and sent to the City of Burien, USCOE and WDFW Area Habitat Biologist for review.

## 2.2 Forage Fish Spawning Surveys

**Goals:** The main goal within this monitoring plan for the study of forage fish is to determine the presence or absence of incubating forage fish eggs in the project area.

**Objectives/Tasks:** To meet the above goals, the following tasks will be conducted through a field survey, data reduction and analysis. Surveys shall be conducted each winter (November-February) for 5 years and include the following components:

A biologist certified as capable of identifying forage fish spawning substrate and egg sample collection by the Washington Department of Fish and Wildlife (WDFW) will conduct forage fish surveys. WDFW forage fish spawn sampling protocols (Moulton and Penttila, 2001) will be implemented to monitor the presence of incubating forage fish eggs in the upper intertidal zone. Principal species of concern include surf smelt, sandlance, Pacific herring, and rock sole. As described in the protocols, the sampling will consist of 1) obtaining a bulk sample of mixed sand and gravel from the upper intertidal region of the beach, 2) condensing the bulk sample to a manageable volume, and 3) examining the condensed sample under a dissecting microscope to determine the presence or absence of eggs. The survey unit for these investigations shall be 100 feet of shoreline and a tidal elevation generally around MHHW. Final survey unit location and number will depend upon the biologist's observations of site substrate conditions but shall include the length of the project area and some representative sites to the south and north of the project area. No less than 5 survey units will be sampled during each sampling event. Four survey units will be in the project area and one survey unit will be located in the non-modified area to the south of the project site. Survey unit location and tidal elevation will be determined at the time of sampling by the biologist in order to focus sampling on the most likely areas based on substrate and tidal elevation that will have incubating forage fish eggs. To the extent practical based on the biologist's evaluation of site conditions, the survey units in the project area will be distributed throughout its 1,400 foot length. The location of the endpoints of each survey unit will be recorded using a differentially corrected Global Positioning System.

**Deliverables:** Completed map of areas sampled, including notation of those survey units with eggs identified. Completed WDFW sampling sheets for each survey unit.

## 2.3 Physical Surveys

### 2.3.1 Beach Topography and Profile Analysis

**Goals:** There are 2 goals within this monitoring plan for the analysis of physical beach conditions.

1. Beach Profile Maintenance
2. Document changes to Backshore Area

**Objectives/Tasks:** To meet the above goals, the following tasks will be conducted through a field topographic survey, data reduction and analysis following existing work conducted by Coastal Geologic Services of Bellingham, Washington for similar nearshore beach profile and substrate improvements in northern Puget Sound. Using similar work as a model, the project shall be monitored semi-annually for 3 years and annual in years 4 and 5. Monitoring shall include one baseline survey conducted prior to construction and one as-built survey conducted

immediately after construction. Both surveys shall incorporate the restoration area as well as representative lengths of shoreline north and south of the project site.

The monitoring tasks will be carried out through surveying beach profiles established during the Seahurst Park Master Plan development in October of 2002. These transects will be monitored over time with a high-precision total station survey equipment package. Several beach profiles will be generated from the resulting topographic data and will illustrate any changes in slope and elevations. Beach elevation across the width of the beachface will also be monitored to put the upper beach gravel fill in perspective and allow assessment of longevity and performance of the beach substrate materials. Profile surveys should include significant vegetative features such as the waterward edge of dunegrass. Beach topography/profiling surveys should extend from +16' MLLW to +0.0' MLLW, as a minimum, and down to -2.0' MLLW when possible. Measured beach change in the updrift shoreline adjacent to the project area will allow for quantification of net gravel transport within and beyond the fill area over time. All elevations will be computed consistently relative to MLLW a project benchmark in local MLLW datum that is located on the uplands at the site.

Timing of the baseline survey work shall begin in early fall just prior construction. In addition, an as-built survey shall occur in the late fall shortly after construction. The first post-construction survey will occur in February to capture the winter beach profile. In years 2 through 5 surveys shall continue in February to document the degree of winter beach change. A monitoring schedule is provided in Table 1.

**Table 1.** Schedule for the Monitoring Plan.

<b>ACTIVITY</b>	<b>SCHEDULE</b>	<b>YEARS</b>
Baseline Surveys <ul style="list-style-type: none"> <li>● Beach topography and profiles</li> <li>● Characterize Backshore area</li> <li>● Lower bluff topography</li> </ul>	Early Fall	Year 1 Baseline Survey
	Late Fall	Year1 As-built Survey
Post-Construction Monitoring Surveys <ul style="list-style-type: none"> <li>● Beach topography and profiles</li> <li>● Characterize Backshore area</li> <li>● Lower bluff topography</li> </ul>	Late Winter (February)	Years 1-5 Monitoring Survey
Annual Data Report	Summer-Fall	Years 1-5 Monitoring

**Deliverables:** Results and analysis of the monitoring data will be summarized in a simple annual data report and will be transmitted to the City of Burien, and the U.S. Army Corps of Engineers. An as-built report will be submitted soon after the completion of project construction. Annual monitoring report data products will include: a plan view of the study area to scale showing the as-built project location, beach topography, location of planted backshore areas and other significant features, beach profile locations, location of MHHW line (+11.6 ft MLLW) and any significant changes to lower bluff topography affecting the backshore (landslides). As physical monitoring progresses, individual beach profile plots (at 2:1 vertical

exaggeration) will be displayed showing composite profiles over time and discussion of significant changes.

### **2.3.2 Surface Substrate Analysis**

There are 2 goals within this monitoring plan for beach substrate in the study area.

1. Document surface substrate characteristics across the width of the intertidal profile
2. Document changes to beach substrate over time

**Objectives/Tasks:** To meet the above goals, the following tasks will be conducted

using field sampling efforts in concert with physical topography surveys. Surface samples will be collected by hand along existing profile transects and characterized using the Wentworth scale. Samples shall also be taken near but outside the project area for comparison. Initial samples shall be obtained prior to construction in fall of 2003. Special emphasis shall be made to characterize forage fish spawning substrate with results compared graphically and across time as surveys are conducted. Surveys shall be conducted on a timescale identical to that of the physical beach topography surveys.

**Deliverables:** Following each survey, a gradation table and location map for both project and reference areas shall be developed and be transmitted to the City of Burien, and the U.S. Army Corps of Engineers.

## **2.4 Vegetation Monitoring**

Upland vegetation monitoring of plantings conducted by the restoration project will be addressed through existing Burien Parks staff in keeping with their ongoing policy of invasive plant management. Volunteers and marine technology students will augment routine maintenance as directed and supervised by City of Burien to include monitoring of plant survival, extent and diversity. Particular attention should be paid to backshore plantings.

**Deliverables:** Annual reports and maps should be submitted to the USCOE and City of Burien for distribution that include documentation of vegetative maintenance and plantings, plant survival rates and recommendations.

## **3.0 REFERENCES**

City of Burien. 2002. Seahurst Park Master Plan. Prepared by Anchor Environmental for City of Burien, Burien, Washington

Moulton, L.L. and D.E. Pentilla. 2001. San Juan County Forage Fish Assessment Project Field Manual for sampling forage fish spawn in intertidal shore regions. First edition. March 2001, 23pp.

Johannessen, J.W., 2002, *Soft Shore Protection as an Alternative to Bulkheads Projects and Monitoring*, Proceedings of Puget Sound Research 2001, Bellevue WA, Puget Sound Action Team, Session 4b.

Johannessen, J. W., 2003, *Physical Monitoring/Beach Profiling at Lummi Shore Road Restoration Project*, Prepared for Lummi Indian Business Council.

**APPENDIX B**  
Substantive Compliance for  
Section 404 of the Clean Water Act and the  
Rivers and Harbors Act

CENWS-PM-PL-ER

**Seahurst Park Nearshore Restoration  
Burien, King County, Washington  
Substantive Compliance for  
Section 404 of the Clean Water Act  
and the  
Rivers and Harbors Act**

The purpose of this document is to record the Corps' evaluation and findings regarding this project pursuant to Section 404 of the Clean Water Act (CWA) and the Rivers and Harbors Act (RHA).

This document covers the removal of existing intertidal obstructions and placement of sand and gravel substrate from an upland source on the beach along the southern shoreline of Seahurst Park in the City of Burien, King County, Washington.

The information contained in this document reflects the findings of the project record. Specific sources of information included the following:

- a. Seahurst Park Master Plan dated August 2002.
- b. Seahurst Park Project Management Plan (Approved 12 Sept. 2001)
- c. Lincoln Park Final Environmental Assessment dated 2 October 2002.
- d. Lincoln Park Beach Re-Nourishment Final Environmental Assessment dated 2 October 2002.

This document addresses the substantive compliance issues of the Clean Water Act 404(b)(1) Guidelines [40 CFR §230.12(a)] and the Regulatory Programs of the Corps of Engineers [33 CFR §320.4(a)].

## **1. BACKGROUND**

### 1.1 Project Location

The project area is located along the beach on the east shore of East Passage, Puget Sound, within the City of Burien, King County, Washington (SE¼, Section 13, Township 23 North, Range 3 East, Willamette Meridian). Seahurst Park is a wooded 153-acre park located on the shoreline of Puget Sound. The park was transferred from King County to the City of Burien upon its incorporation in 1972. The park is used for community recreation and includes beach access, picnic structures, educational features and walking paths.

### 1.2 Project History

The City of Burien and the Corps of Engineers are investigating restoration alternatives for the Seahurst Park property located on the eastern shore of Puget Sound (Appendix E). The City of Burien has maintained the park property as a recreational feature for the citizens of Burien. As such, simple roadways and footpaths have been developed to serve as access throughout the project site. On the north side of the park, a large promenade has been constructed along with several administrative and educational buildings. Along the southern length of the park (project

area), a 10-foot wide footpath lies on top of a gabion, rock and fill structure located within the upper intertidal zone of Puget Sound. Upslope of the structure is a steep and active hillside colonized by a mix of deciduous and coniferous trees and mostly native understory. A small unnamed tributary (WRIA Trib.0367) flows generally westward through a small and high gradient watershed before entering the park property and into Puget Sound. The restoration objectives are to provide uninhibited nearshore function with respect to sediment transport, woody debris recruitment, marine fish transportation and forage fish spawning. Wildlife objectives include enhanced tributary function and improved shoreline function. Heavy urbanization of central Puget Sound has greatly reduced areas where nearshore function has been allowed to continue unimpeded. Likewise, opportunities to restore function in an area adjacent to natural habitat are very rare.

### 1.3 Project Authority

The proposed project is authorized under Section 206 of the Water Resources Development Act of 1996 as amended, and the City of Burien Seahurst Park Master Plan 2002. The Section 206 authority includes restoration of aquatic resources subject to local sponsor cost sharing, support from the local sponsor and environmental acceptability.

### 1.4 Need and Purpose

King County, the former owner and developer of the park, armored the shoreline of Seahurst Park in the early 1970's. The result of this armoring of the shoreline has been to increase the erosive energy of waves moving sediment northward along the beach or into deeper water. At the same time these seawalls have isolated the beach from one of its primary sources of sediment, the steep bluffs above the park. The results have been a dramatic drop in the beach elevation of approximately three to four feet over the past 30 years, plus a degradation of the beach as a habitat for salmon, and the species they depend on. Of particular concern and interest are two species of "forage fish", sand lance (*Ammodytes hexapterus*) and surf smelt (*Hypomesus pretiosus*), that are both critical food resources for salmon. These two fish species depend on upper intertidal sandy/fine gravel beaches for spawning. Seahurst Park has been identified by the Washington Department of Fish and Wildlife as spawning habitat for both forage fish species.

## **2.0 Availability Of Less Environmentally Damaging Practicable Alternatives to Meet the Project Purpose.**

The alternatives evaluated for this project were as follows:

2.1. Alternative 1 (No Action). Under the "No Action Alternative," gabion, rock and fill removal would not take place. No additional substrate would be placed at Seahurst Park. Damage to existing gabion structure would continue and the beach conditions, over time, would continue to be degraded and net shore drift impeded. The beach would gradually become steeper and the area and value of intertidal habitat would be reduced as a result. Maintenance costs to repair the gabion structure and trail would increase over time. Upslope wasting events (landslides) will also continue to be a maintenance issue for the City of Burien. Intertidal habitat loss would continue through lack of material normally provided by littoral drift. The "No Action Alternative" would not meet the need and purpose of the project, the local sponsors or the

environment. Therefore, the no action alternative is considered to be a less practicable alternative to nearshore restoration.

2.2. Alternative 2 (Proposed Action). The proposed project consists of removing approximately 3110 CY of gabion and toe stone and 5085 CY of path fill material in the form of an existing gabion and fill structure located between elevations +18' and +9' MLLW. Rock and fill removal will be conducted by hydraulic excavator. Approximately 835 CY of armor and gabion rock will be stockpiled by the City of Burien on an upland site for future trail building and landscaping uses. The Corps conducted soils analysis of the existing path fill between stations 0+00 and 14+00. It was found that the path fill between stations 9+00 and 14+00 is composed of mixed gravel and sand materials suitable for re-use as a portion (14%, 700 CY) of the coarse sand/gravel surface layer of the restored beach. The remaining 4735 CY of path fill and armor and gabion rock will be placed on a barge for transportation to an upland disposal facility. A small hydraulic excavator would remove drift logs and stockpile them for re-use on the restored beach backshore along with any trees removed during construction. The ordinary high water mark at Seahurst Park (MHHW) is considered to be +11.66' above Mean Lower Low Water (MLLW).

Removal of material unsuitable for replacement on the beach or being stockpiled for later upland uses will be loaded onto a barge and taken to an approved upland disposal site. This operation will require a temporary loading ramp be constructed at the project site to facilitate safe loading of the barge by trucks. This ramp will be constructed of rock and fill and be removed when barge operations are complete. Location of the temporary loading ramp will be located in an area that minimizes impact to beach resources. Only one ramp will be constructed.

Prior to placement of beach materials for reestablishment of beach profile and function, angular armor and gabion rock exposed on the surface of the intertidal beach with a diameter of 10 inches or greater will be removed between elevations +9.0' MLLW and +2.0' MLLW. This material is below the elevation of the intact gabions and armor rock. An excavator will walk the beach and remove the rocks prior to placement of beach substrates. Any rock or unsuitable material remaining on the beach from the temporary loading ramp will be removed at that time.

Imported Materials:

When structural and intertidal rock removal is completed, approximately 4000 cy of washed coarse gravel (2.5 inch to 3/4 inch) will be used to create an underlying beach surface on a 5:1 slope from the backshore between +14' MLLW and +5.0' MLLW (Appendix E). A conveyor located on an offshore barge and work platform will place the gravels. The gravels will be roughly graded by excavator or small bulldozer in preparation for further overlays of material and to ensure longevity of the beach backshore elevation

A second, surface layer of mixed gravel and sand material will be placed over the washed coarse gravel. The second layer will be approximately 5350 CY (350 CY on-site re-used material mentioned above, and 5000 CY imported material) of fine gravel and coarse sand that includes particle widths between 1mm and 8mm. This material is designed to mimic reference beach surface substrates south of the project limits and provide forage fish spawning habitat. The material will be placed on a 6:1 slope between elevations +15' MLLW and +4.0' MLLW. The

material will cover any exposed coarse gravel and fill any remaining areas of low elevation caused by the equipment. The material will be placed between the same stations as earlier substrate placements (Stations 4+25 and 14+00). A barge mounted conveyer would conduct the substrate placement throughout the placement elevations. Material unloaded from the barge would be left to wave and tidal action for final sorting which is expected to sort material to a final grade of 7:1. A barge would deliver all equipment and materials to the work area and construction activity would be confined to the project footprint.

Logs and other backshore habitat features removed prior to gabion excavation and stockpiled on-site will then be replaced along the project backshore along with any other trees removed as part of project construction.

#### Vegetation

Bluff soils exposed during the excavation of the gabion and fill structure will be sloped between 2:1 and 3:1 and covered with approximately 6" of topsoil in preparation for plantings. Within the first few months post construction, most plantings will be for erosion control. Additional vegetation will be planted in early spring using native shrubs and trees for the purpose of increasing diversity and managing invasive species. The planting will be conducted by the City of Burien. In addition, native dunegrass will be planted along the far backshore of the project location. Dunegrass already exists in some locations. Planting of dunegrass will occur in the spring following construction to ensure winter storm events do not damage the plants.

#### Future Trail Restoration (by City of Burien)

A trail system that would restore access to the restored beach will be pursued by the City of Burien. The trail restoration will include features to minimize impacts and facilitate beach restoration such as moving the trail landward, and eliminating the south 120 linear feet of trail. The trail will remain above MHHW, and above the beach backshore. Two small drainage streams will be reconnected to the beach. Trail construction and maintenance are an integral part of project sustainability by allowing connectivity of upland material and debris to the backshore (Appendix F).

#### Timing

By restricting site access and project footprints and construction time, disruptions to aquatic biota will be minimal. Construction is anticipated between the months of September and October 2003, to coincide with environmental work windows and lower park use. This period allows for avoidance of all environmental windows except for forage fish spawning. Much of the construction is tide dependant and will require approximately one month to complete. Actual work will take approximately 2 weeks.

2.3. Alternative 3. (Place beach nourishment material seaward of gabions). Under this alternative, beach material of a composition similar to areas found updrift would be placed in front of the gabion structures to recreate appropriate grain size and slope characteristics. In many areas around Puget Sound, planners have looked towards placing beach nourishment in front of hardened structures to mimic natural processes and although the success of these measures varies, the concept appears to return some natural function to degraded beaches for

varying lengths of time. The beach bluffs updrift of the project site would be relied upon to continue feeding the placement site and contribute to its longevity.

Benefits from this alternative should be seen in improved juvenile salmonid habitat as well as increased invertebrate production. Forage fish spawning is a potential benefit so long as sediment longevity and wave action don't preclude spawning success. Tributary conditions would remain unchanged although the placement of nourishment may contribute to sediment aggregation at the tributary mouth since it is located downdrift of the placement site. Vegetation benefits would be minimal, as recruitment to the nearshore of woody debris would be restricted by the gabion structure. Wildlife would benefit slightly as the nearshore environment becomes more productive and more accessible in the short term. Over the long term the nourishment material would be moved along the littoral drift cell and the beach would return to its preproject composition. The gabion structure would remain an impediment to upper intertidal production and upland connectivity. Therefore, the no action alternative is considered to be a less practicable alternative to nearshore restoration

2.4. Alternative 4 (Removal of Gabions). Under this alternative, the all armor and gabion structures and non-native fill would be removed and the hillside allowed to be influenced by beach processes. No additional material would be provided to enhance native beach substrate or slope. Undeveloped slopes south of the park boundary would serve to provide additional material to the beach.

Under this alternative, the Corps would remove existing shoreline protection structures and fill present along the southern portions of the park. Removal would include all areas where the structure influences nearshore processes (as determined by vegetation and beach debris). Estimated length of gabion removal is approximately 1200 feet. Existing slopes behind the gabion structure would be allowed natural access to high tides with no substitute erosion control provided. Without incorporation of additional beach grade material after removal of the intertidal structures, benefits to the intertidal zone are not assured in the short term. Therefore, the no action alternative is considered to be a less practicable alternative to nearshore restoration

**Findings.** The Corps rejected Alternatives 1, 3 and 4 because they would either not meet the authorized project objectives, or they were not considered less environmentally damaging alternatives than the proposed action.

### **3.0 Significant Degradation, Either Individually or Cumulatively, To the Aquatic Environment**

3.1 Impacts on Ecosystem Function. Intertidal habitats on and adjacent to the project area at Seahurst Park will be disturbed by the restoration construction. The Corps has assessed potential impacts from the construction and determined that they will generally be highly localized in nature, short in duration, and minor in scope (see draft Seahurst Park Nearshore Restoration Environmental Assessment and Biological Evaluation, July 2003). Impacts of the work on salmonids, other fish, and intertidal communities will be reduced and/or avoided through implementation of timing restrictions and BMP's. Due to these measures, impacts to these important resources should not be significant either individually or cumulatively.

3.2. Impacts on Recreational, Aesthetic and Economic Values. Construction equipment may temporarily disrupt recreational use in Seahurst Park in the vicinity of the project area. However, no significant adverse effects on recreation, aesthetics, or the economy are anticipated (see draft Seahurst Park Nearshore Restoration Environmental Assessment, July 2003). The removal of intertidal fill and placement of material onto the beach will eliminate the conversion of current high intertidal beach to subtidal beach and improve nearshore connectivity and function allowing for continued use of the shore for recreational purposes.

**Findings.** The Corps has determined that there would be no significant adverse impacts to aquatic ecosystem functions and values or recreational, aesthetic, and economic values.

#### **4.0 Appropriate and Practicable Measures To Minimize Potential Harm to the Aquatic Ecosystem**

4.1. Impact Avoidance Measures. Potential impacts of the proposed work on salmonids will be avoided through the implementation of timing restrictions. For the protection of bull trout and outmigrating juvenile salmonids, work will not occur during the juvenile outmigration period or the bull trout work closure period, 15 February through 15 July. To avoid impacts to water quality, all beach fill material shall be placed in the dry during periods of low tide and earth-moving equipment shall remain landward of the toe of the beach fill at all times (except to retrieve non-native angular rock in the lower intertidal zone for disposal). To further avoid potential impacts, washing of material from barges or placement of fill by hydraulic means is prohibited and no part of any beached barge may rest on the bottom below an elevation of -2.0' MLLW.

4.2. Impact Minimization Measures. Transportation of material between the beach and the barge must be carried out within a clearly marked 50-foot-wide access zone. The access zone shall remain unchanged throughout construction. Beach nourishment material will be placed in the intertidal zone, thereby mimicking natural sediment erosion and transport processes to the maximum extent practicable.

4.3. Compensatory Mitigation Measures. The beach nourishment program is considered to be self-mitigating. Environmental monitoring will be conducted to confirm both benefits and impacts of the project.

**Findings.** The Corps has determined that all appropriate and practicable measures have been taken to minimize potential harm.

#### **5.0 Other Factors In the Public Interest.**

5.1. Fish and Wildlife. The Corps has coordinated with State and Federal agencies to assure careful consideration of fish and wildlife resources. The Corps will continue to coordinate with State Fish and Wildlife agencies and has prepared a Biological Evaluation in accordance with the Endangered Species Act. The Corps will assure full compliance with the Endangered Species Act prior to project implementation.

5.2. Water Quality. A Public Notice (CENWS-PL-02-06) was prepared and will serve as an application for a Section 401 Water Quality Certification from the Washington Department of Ecology (Ecology). Ecology is expected to issue a Water Quality Certification for the work proposed for the fall of 2003. The Corps will abide by the conditions of the State issued Water Quality Certification to ensure compliance with State water quality standards.

5.3. Historic and Cultural Resources. No vehicle, equipment, staging or other direct or indirect disturbances are planned near any known sites. Direct soil disturbances as part of this project would occur entirely on top of fill placed originally in the 1970's. Beach substrate placement on the existing beach profile would not result in loss or damage of any unknown cultural resources sites. The work would not adversely affect salmonid populations or impair fishing sites reserved by treaties for Native American use. Although Native Americans historically used the area for collection of shellfish and for fishing, the tribes do not currently use Seahurst Park directly for such purposes.

5.4. Activities Effecting Coastal Zones. The proposed action will restore the project area to a state comparable to its natural condition. Rock removal work will remain within the footprint of the original project, and will not cause substantial adverse effects to shore resources or the environment. Beach material placement will consist of clean materials suitable in size and quantity for natural beach processes. Pursuant to Section 173-27-040 and 173-27-060 of the Washington Administrative Code, the Corps determined that this proposal is consistent to the maximum extent practicable with the State of Washington Shoreline Management Program. A consistency statement has been completed and submitted to the Department of Ecology for review and concurrence.

5.5. Environmental Benefits. The proposed nourishment project would stop the conversion of the southern beach along Seahurst Park from a gravel intertidal beach to a subtidal gravel, cobble and clay beach and improve upland connectivity and littoral transport. The removal of fill and improvements to the beach profile would maintain the range of intertidal elevations necessary to support forage fish spawning, epibenthic invertebrates which serve as prey for a wide variety of birds and increase productivity for marine fishes.

5.6. Navigation. No adverse effects to navigation will occur as a result of the proposed restoration work.

**Findings.** The Corps has determined that this project is within the public interest.

**6.0 Conclusions.** Based on the analyses presented in project NEPA documents, as well as the following 404(b)(1) Evaluation and General Policies for the Evaluation of Permit Applications analysis, the Corps finds that this project complies with the substantive elements of Section 404 of the Clean Water Act and the Rivers and Harbors Act.

**7.0. 404(b)(1) Evaluation [40CFR§230]- Potential Impacts on Physical and Chemical Characteristics (Subpart C)**

7.1 Substrate [230.20]. The existing intertidal beach substrate consists of small gravel with patches of coarse sand, cobble and boulder. On average, the beach material grain size gradations for the intertidal beach will mimic those of the natural material. The supratidal substrate consists of boulder and fill over much of the project site. The size of the new material will closely mimic that which is naturally present.

7.2 Suspended Particulate/Turbidity [230.21]. Any increases in turbidity resulting from the proposed action would as a result of the grain size of the beach material. The material will be selected to minimize excessive amounts of fines. Any sediment plumes attributable to the resultant material would be temporary, localized, and equivalent to those created by natural sediment transport processes. Water quality monitoring during construction will be conducted to ensure adequate water quality protections.

7.3 Water Quality [230.22]. No significant water quality effects are anticipated (see 7.2 above).

7.4 Current Patterns and Water Circulation [230.23]. The removal of the nearshore structures and placement of beach materials will not obstruct flow, change the direction or velocity of water flow/circulation, or otherwise notably change the dimensions of the receiving water body. The material to be placed on the intertidal beach is expected to contribute to the littoral drift system and has been specifically selected to mimic the native sediment characteristics. In the vicinity of the project, the net alongshore drift appears to be toward the north.

7.5 Normal Water Fluctuations [230.24]. The discharge of nourishment materials will not impede normal tidal fluctuations. Beach material will be placed high in the intertidal zone, thereby mimicking natural sediment erosion and transport processes to the maximum extent practicable. The proposed project would restore the conversion of the beach fronting the gabion and rock structure from a high intertidal beach to a subtidal bench. Loss of material to littoral drift and wave action is expected to occur but is not expected to cause degradation of the Seahurst Park beach.

7.6 Salinity Gradients [230.25]. The discharge of beach materials will not divert or restrict tidal flows or affect salinity gradients (see 7.5. above).

## **8.0 404(B)(1) EVALUATION [40 CFR §230]- Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)**

8.1 Threatened and Endangered Species [230.30]. Pursuant with Section 7 of the Endangered Species Act, the Corps prepared a Biological Evaluation (BE) to assess potential impacts of the proposed work on species protected under the Act. This document concluded that the proposed maintenance work was not likely to adversely affect the bald eagle (*Haliaeetus leucocephalus*), bull trout (*Salvelinus confluentus*), and chinook salmon (*Oncorhynchus tshawytscha*). The BE concluded that the project would have no effect on the marbled murrelet (*Brachyramphus marmoratus*), Steller sea lion (*Eumetopias jubatus*), humpback whale (*Megaptera novaeangliae*) or leatherback sea turtle (*Dermochelys coriacea*). The BE and supporting cover letters will be sent to the National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service for concurrence.

8.2. Aquatic Food Web [230.31]. The proposed action is not expected to have a significant affect on the eelgrass and algae in the vicinity of project area. Construction activities would likely disturb the upper edge of the intertidal zone where *Ulva* and other algae were observed in summer of 2002. Substantial impacts to eelgrass are not anticipated due to the low elevation at which eelgrass occurs in the work zone. Any realized impacts to algae would be temporary and conducted during the onset of fall and winter, typically the period of least growth. Within several months, any disturbed algae are expected to recover. Environmental monitoring will be used to confirm any impacts.

By burying the existing beach surface, the proposed work would temporarily decrease populations of epibenthic organisms within the project footprint. Potential adverse effects would be minimal, as the work would occur in the fall as epibenthic production seasonally decreases and the project footprint represents only a small proportion of the available foraging habitat in the vicinity. Any dip in epibenthic abundance would be short-term. Peak abundance of juvenile salmonids at the project site occurs in the spring allowing for recovery time of epibenthic communities. Adult salmon may occur in the vicinity of the project when the work would occur but these fish are larger and not as directly dependent upon the upper intertidal nearshore environment.

Forage fish spawning habitat for herring, surf smelt, and sand lance is present at the project area and may be directly impacted by the proposed action. The purpose of the project is to improve in the long term the conditions for forage fish spawning by improving substrate that sand lance and surf smelt prefer. To minimize impacts to possible forage fish spawn, the project will be conducted outside the peak spawning period. Adverse effects to other marine fish are not anticipated since the work would occur at relatively high elevations (higher than +6.0' MLLW) and the disturbance would be temporary.

8.3. Wildlife [230.32]. Noise associated with disposal operations may have an effect on bird and marine mammals in the project vicinity. The impacts of any sound disturbance would likely result in temporary displacement of animals rather than injury. Disposal operations are not expected to result in a long-term reduction in the abundance and distribution of any prey items. No breeding or nesting areas will be directly impacted. The work window avoids sensitive nesting and wintering periods for bald eagles.

## **9.0. 404(B)(1) EVALUATION [40 CFR §230]- Potential Impacts to Special Aquatic Sites (Subpart E)**

9.1. Sanctuaries and Refuges [230.40]. The proposed project will not impact any designated sanctuary or refuge area.

9.2. Wetlands [230.41]. Nourishment material will not be discharged in wetland areas. The project will not alter the inundation patterns of wetlands.

9.3. Mudflats [230.42]. Nourishment material will not be discharged in or near mudflat areas. The project will not alter the inundation patterns of mudflats.

9.4. Vegetated Shallows [230.43]. A variety of algal species occur in the project area but most of the colonization occurs in the lower intertidal elevations (below +6.0' MLLW). At lower elevations, the substrate changes to cobble. *Ulva* and *Enteromorpha* dominate the zone between about +6.0' and -2.0' MLLW. Between +2.0' and -2.0' MLLW and lower, a mix of *Laminaria*, *Iridea*, and *Zostera*, can be found covering the substrate. No *Macrocystis* or *Nereosystis* was found off the project area. Construction activities would likely disturb the upper edge of the intertidal zone where *Ulva* and *Enteromorpha* were observed in summer of 2002. Grounding of the barge may indirectly impact the more diverse algae community in the lower intertidal zone. Substantial impacts to eelgrass are not anticipated due to low elevation at which eelgrass occurs in the work zone. The impacts to algae would be temporary and conducted during the onset of fall and winter, typically the period of least growth. Within several months, disturbed vegetation would be expected to recover.

The project will not change circulation patterns, increase nutrients, or result in any chemical contamination. As described in the Aquatic Food Web section, the placement of beach substrate material is not expected to reduce the value of the area as nesting, spawning, nursery, cover, or forage habitat. The proposed work would cause temporary and minor disturbance to the macroalgae and eelgrass areas in and directly adjacent to the construction area. However, due to the small scope of the proposed project and prudent management of the barge, substantial adverse impacts or permanent loss to the existing eelgrass and macroalgal communities are not anticipated.

9.5. Coral Reefs [230.44]. Not applicable.

9.6. Riffle and Pool Complexes [230.45]. Not applicable.

## **10. 404(B)(1) EVALUATION [40 CFR §230]- Potential Effects on Human Use Characteristics (Subpart F)**

10.1. Municipal and Private Water Supplies [230.50]. Not applicable.

10.2. Recreational and Commercial Fisheries [230.51]. The project is not expected to affect recreational or commercial fisheries.

10.3. Water Related Recreation [230.52]. Construction vehicles and barges will not likely disrupt recreational use of the Seahurst Park beach in the project area. During the fall, most visitors to Seahurst Park utilize the upland areas rather than the shoreline. There are no water related recreation access points near the project site. Given the timing, duration and size of the project, substantial impacts to recreation are not anticipated during the construction period. After construction, recreational use of the park and shoreline would be similar to before construction.

10.4. Aesthetics [230.53]. Localized, temporary increases in noise and turbidity will occur while construction equipment is operating. Prior to final grading, small stockpiles of gravel will be present on the upper beach. These stockpiles will not block views of the East Passage of

Puget Sound, nor mar the view of the Seattle shoreline from points West. After project completion, the project area will rapidly become indistinguishable from adjacent, undisturbed beach areas.

10.5. Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves [230.54]. The project is located within a City of Burien park. Seahurst Park offers picnic areas, water access, and hiking trails. To minimize disruption to park use, construction vehicles may access the beach from barges only and will be restricted to beach areas with the project footprint. Given the timing, short duration of construction, and small size of the project, substantial impacts to recreation are not anticipated during the construction period. After construction, recreational use of the park and shoreline would be similar to before construction.

#### **11. 404(B)(1) EVALUATION [40 CFR §230]- Evaluation and Testing (Subpart G)**

11.1. General Evaluation of Dredged or Fill Material [230.60]. The fill material will be composed of clean coarse sand, gravel, and other naturally occurring inert material obtained from upland borrow sources for which all state and local permits have been obtained.

11.2. Chemical, Biological, and Physical Evaluation and Testing [230.61]. The extraction site is sufficiently removed from sources of pollution to provide reasonable assurance that the proposed discharge material is not a carrier of contaminants. Therefore, the required determinations pertaining to the presence and effects of contaminants can be made without testing.

#### **12. 404(B)(1) EVALUATION [40 CFR §230]- Action to Minimize Adverse Effects (Subpart H)**

12.1. Actions Concerning the Location of the Discharge [230.70]. The effects of the discharge will be minimized by limiting discharge volume to the maximum practicable extent. The discharge will not disrupt tidal flows, nor create standing bodies of water. The location and timing of the proposed discharge has been planned to minimize impacts to marine organisms.

12.2. Actions Concerning the Material to be Discharged [230.71]. No treatment substances nor chemical flocculates will be added to the beach materials before disposal. The material will be sorted at the borrow site to reduce the concentration of fines.

12.3. Actions Controlling the Material after Discharge [230.72]. Methods for reducing the potential for erosion, slumping, or leaching will not be employed, since the discharge material is intended to create a natural beach with very limited need for maintenance. Final grading of the discharged material will occur in the dry during low tides to avoid direct fishery and water quality impacts. Discharge will not occur during periods of high wind and wave action.

12.4. Actions Affecting the Method of Dispersion [230.73]. Fill removal and beach nourishment material will be placed high in the intertidal zone, thereby mimicking natural sediment erosion and transport processes to the maximum extent practicable. Beach material will be sorted at the borrow site to minimize the release of suspended particulates.

12.5. Actions Related to Technology [270.74]. Appropriate machinery and methods of transport of the material for removal and discharge will be employed. To minimize disturbance of areas outside of the project footprint, the new substrate will be delivered to the project site via barge and discharged onto the upper beach with a conveyor. All machinery will be properly maintained and operated.

12.6. Actions Affecting Plant and Animal Populations [270.75]. The timing of the proposed discharge operations will minimize the potential for adverse effects to animal populations, particularly juvenile salmonids and bald eagles. The placement of the substrate will create intertidal beach habitat for salmonids, other marine fish, and their prey resources.

12.7. Actions Affecting Human Use [230.76]. The discharge will not result in damage to aesthetically pleasing features of the aquatic landscape. The discharge will not increase incompatible human activity in remote fish and wildlife areas.

12.8. Other Actions [230.77]. Not applicable.

**13. General Policies for the Evaluation of Permit Applications [33 CFR §320.4]**  
**Public Interest Review [320.4(a)].** The Corps finds these actions to be in compliance with the 404(b)(1) guidelines and not contrary to the public interest.

13.1. Effects on Wetlands [320.4(b)]. No wetlands will be altered by the proposed project.

13.2. Fish and Wildlife [320.4(c)]. U.S. Fish and Wildlife Service and the National Marine Fisheries Service were consulted to ensure that direct and indirect loss and damage to fish and wildlife resources attributable to the proposed maintenance work will be minimized.

13.3. Water Quality [320.4(d)]. The Corps will abide by conditions of a Section 401 Water Quality Certification upon issuance by the Washington Department of Ecology to ensure compliance with Washington water quality standards.

13.4. Historic, Cultural, Scenic, and Recreational Values [320.4(e)]. No wild and scenic rivers, historic properties, National Landmarks, National Rivers, National Wilderness Areas, National Seashores, National Recreation Areas, National Lakeshores, National Parks, National Monuments, estuarine and marine sanctuaries, or archeological resources will be adversely impacted by the proposed restoration work. The restoration of a gently graded beach profile and consideration for upland trail systems would maintain recreation values.

13.5. Effects on Limits of the Territorial Sea [320.4(f)]. The proposed maintenance work will not alter the coastline nor baseline from which the territorial sea is measured for the purposes of the Submerged Lands Act and international law.

13.6. Consideration of Property Ownership [320.4(g)]. Not applicable.

13.7. Activities Affecting Coastal Zones [320.4(h)]. The proposed work complies with the policies, general conditions, and general activities specified in the King County Shoreline Management Master Plan and Washington Administrative Code to the maximum extent practicable.

13.8. Activities in Marine Sanctuaries [320.4(i)]. Not applicable.

13.9. Other Federal, State, or Local Requirements [320.4(j)]

*a. National Environmental Policy Act.* An environmental assessment (EA) has been developed to satisfy the documentation requirements of NEPA.

*b. Endangered Species Act.* In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. A Biological Evaluation (BE) has been prepared and will be submitted to USFWS and NMFS. The NMFS and USFWS are expected to respond to the determinations made in the BE for effects to threatened and endangered species.

*c. Clean Water Act.* The Corps must demonstrate compliance with the substantive requirements of the Clean Water Act. This document records the Corps' evaluation and findings regarding this project pursuant to Section 404 of the Act. Public Notice CENWS-PL-02-06 dated 1 July 2003 served as an application for a Section 401 Water Quality Certification from the Washington Department of Ecology. Ecology is expected to issue a Water Quality Certification for the project prior to construction in fall of 2003. The Corps will abide by the conditions of the State issued Water Quality Certification to ensure compliance with State water quality standards.

*d. Coastal Zone Management Act.* The Coastal Zone Management Act of 1972, as amended, requires Federal agencies to carry out their activities in a manner which is consistent to the maximum extent practicable with the enforceable policies of the approved Washington Coastal Zone Management Program. The proposed action will restore the southern portions of Seahurst Park to a fully functioning nearshore condition. Rock removal work will remain well within the footprint of the original project, and will not cause substantial adverse effects to shore resources or the environment. Pursuant to Section 173-27-040 and 173-27-60 of the Washington Administrative Code, the Corps determined that this proposal is consistent to the maximum extent practicable with the State of Washington Shoreline Management Program.

*e. Rivers and Harbors Act.* This document records the Corps' evaluation and findings regarding this project pursuant to the Rivers and Harbors Act. No adverse effect to navigation is anticipated.

*f. National Historic Preservation Act.* The National Historic Preservation Act (16 USC 470) requires that the effects of proposed actions on sites, buildings, structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. The project is working with applicable agencies and tribes to ensure the project will have no effect on historic or cultural resources.

*g. Fish and Wildlife Coordination Act.* The Fish and Wildlife Coordination Act (16 USC 470) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. This goal is accomplished through Corps funding of U.S. Fish and Wildlife Service habitat surveys evaluating the likely impacts of proposed actions, which provide the basis for recommendations for avoiding or minimizing such impacts. A Fish and Wildlife Coordination Act Report is not required for restoration work although members of the FWCA group have been consulted throughout project development.

13.10. Safety of Impoundment Structures [320.4(k)]. Not applicable.

13.11. Floodplain Management [320.4(l)]. The proposed maintenance work will not alter any floodplain areas.

13.12. Water Supply and Conservation [320.4(m)]. Not applicable.

13.13. Energy Conservation and Development [320.4(n)]. Not applicable.

13.14. Navigation [320.4(o)]. No adverse effects to navigation will occur as a result of the proposed maintenance work.

13.15. Environmental Benefits [320.4(p)]. The proposed nourishment project would eliminate the conversion of the southern Seahurst Park beach from an intertidal gravel beach to a subtidal beach. The proposed project would provide a range of intertidal elevations necessary to support the epibenthic invertebrates which serve as prey for a wide variety of marine fishes and allow for better continuity to upland sediment and food sources.

13.16. Economics [320.4(q)]. During the feasibility study for removal of the erosion control project, it placement of the beach substrate was economically justified.

13.17. Mitigation [320.49(r)]. Potential impacts of the maintenance work on salmonids and bald eagles will be avoided through implementation of timing restrictions. For the protection of these species, work will occur between 1 September and October 31. The use of rounded gravels of similar size to the native substrate presently on the nearby reference beach will minimize habitat impacts of the proposed action.

# APPENDIX C

## Preparers and Contributors

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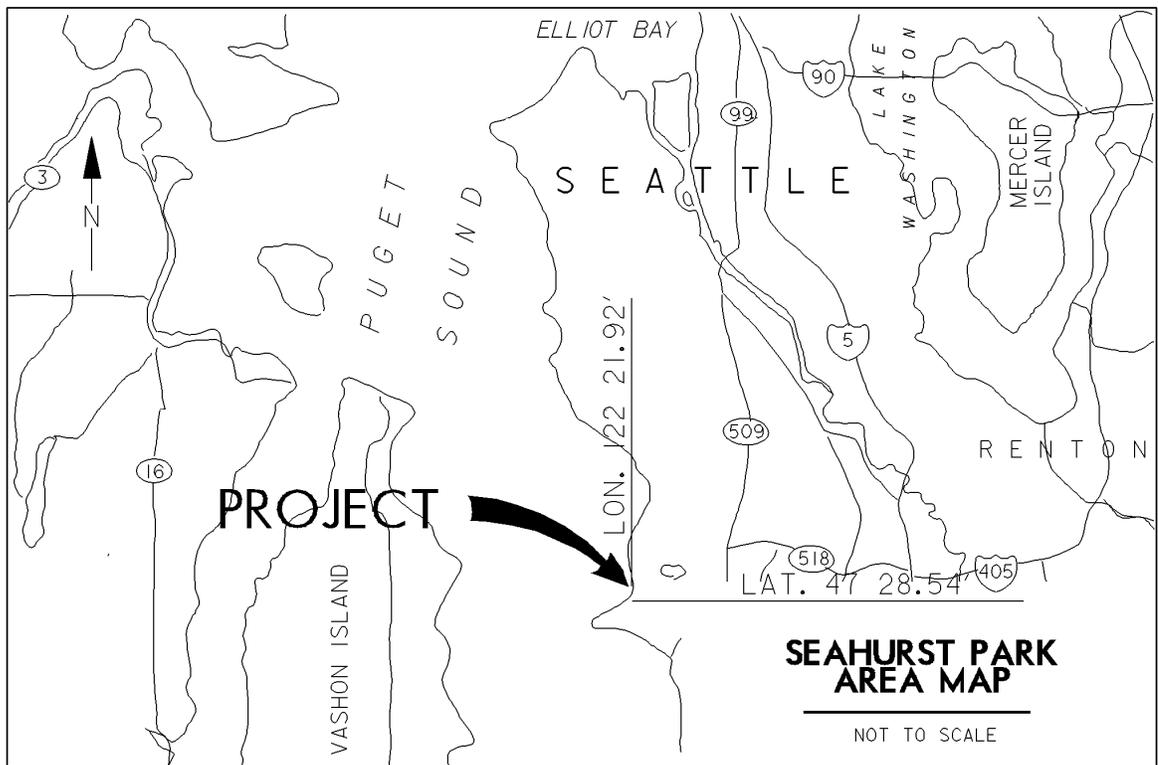
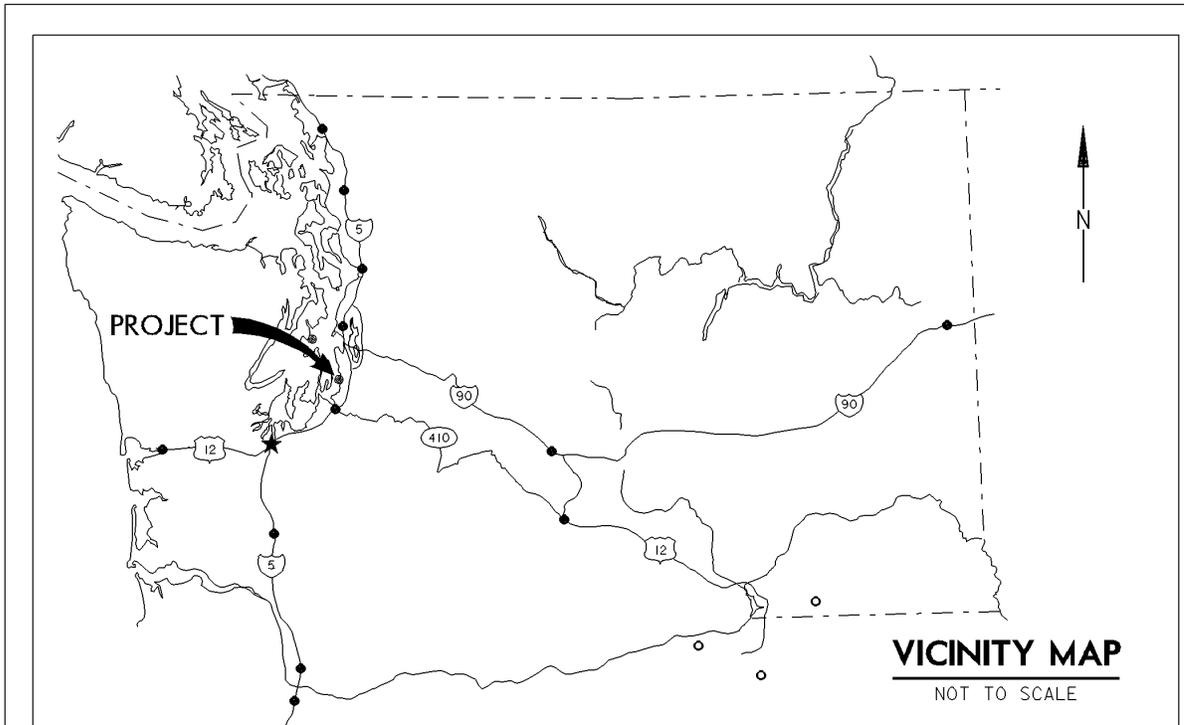
# APPENDIX D

## Required State and Federal Agency Responses

1. Washington State Department of Ecology: Water Quality Certification/Coastal Zone Consistency Determination, dated \_\_\_\_\_.
2. National Marine Fisheries Service: Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, dated \_\_\_\_\_.
3. U.S. Fish and Wildlife Service: Endangered Species Act Section 7 Informal Consultation (USFWS Reference 1-3-02-I-2123), dated \_\_\_\_\_.

# APPENDIX E

## Project Design Drawings



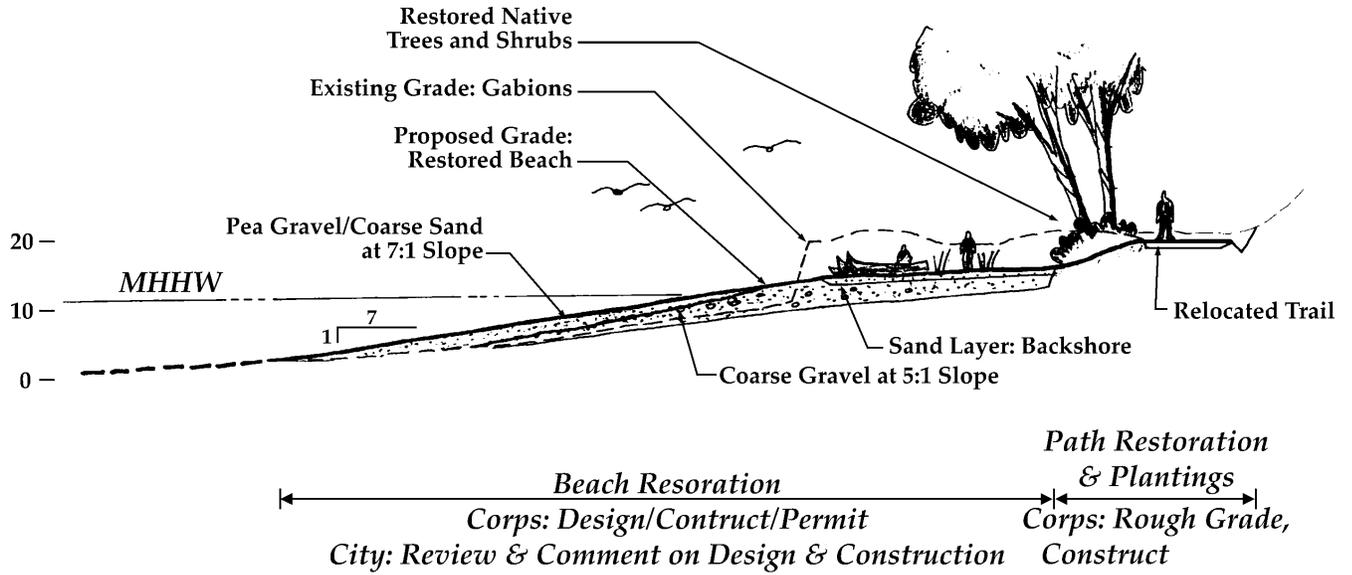
U.S. ARMY ENGINEER DISTRICT, SEATTLE  
 CORPS OF ENGINEERS  
 Seattle, Washington

BURIEN, WA & VICINITY  
 SEAHURST PARK SHORELINE REHABILITATION

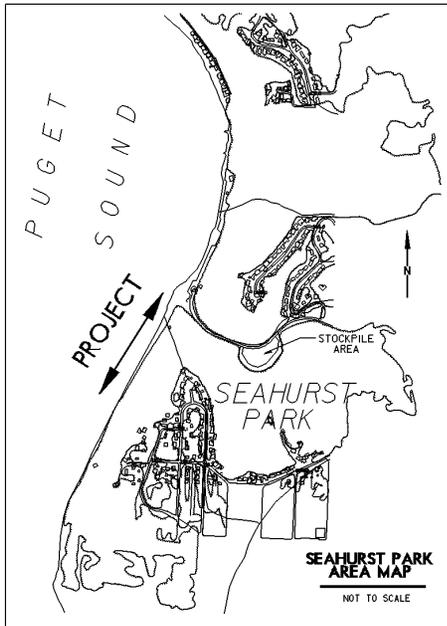
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PUBLIC NOTICE  
 CENWS-PL-02-06

SHEET  
 1 OF 3

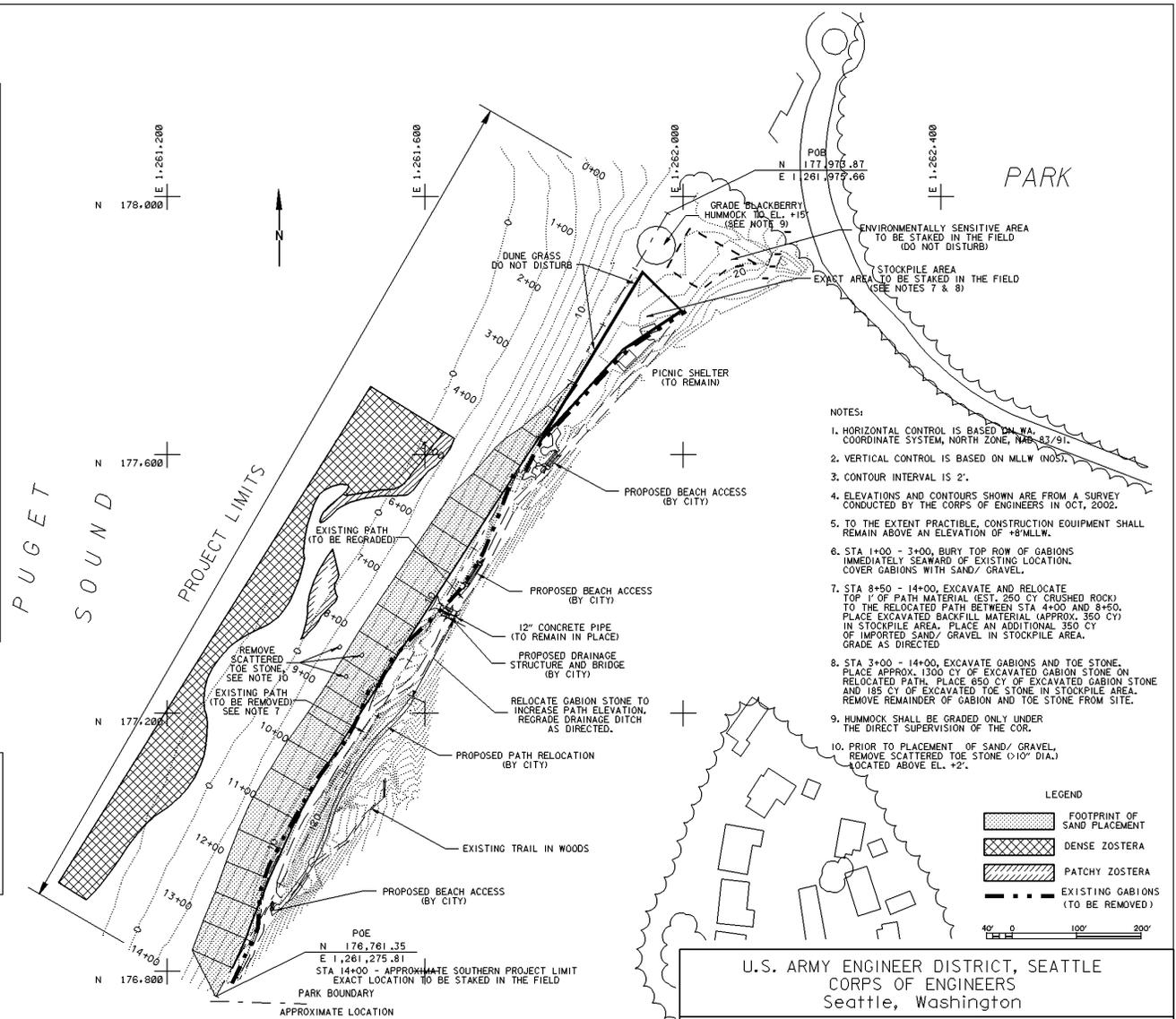


## Typical South Shoreline Cross Section

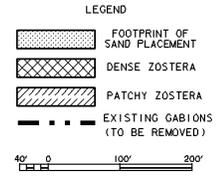


TIDAL DATUMS FOR DES MOINES WASHINGTON

DATUM PLANE	ELEVATION REFERRED TO MLLW
Highest Tide (Estimated)	15.00 +/- 0.5
Mean Higher High Water	11.86
Mean High Water	10.77
Mean (High) Tide Level	8.82
Mean Low Water	2.86
Mean Lower Low Water	0.00
Lowest Tide (Estimated)	-4.5 +/- 0.5



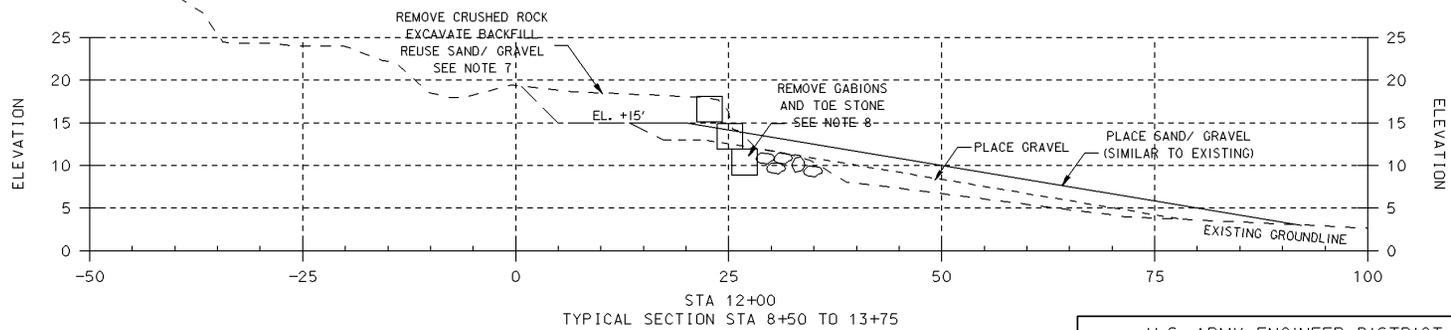
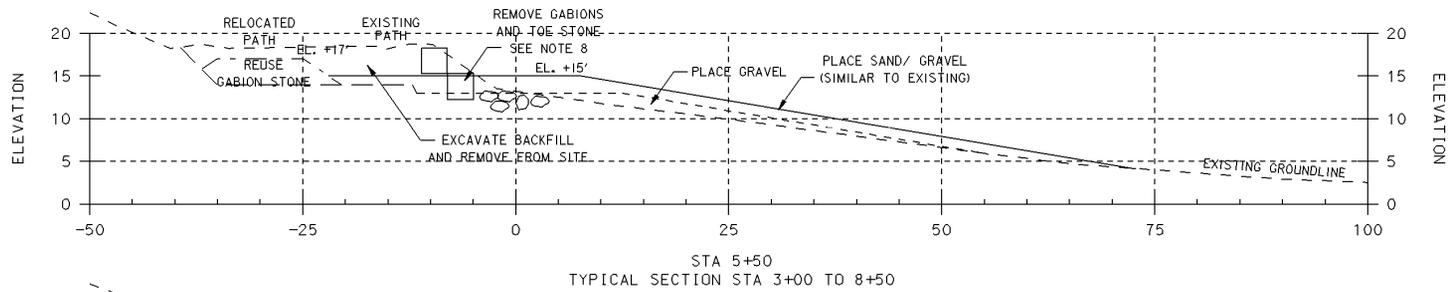
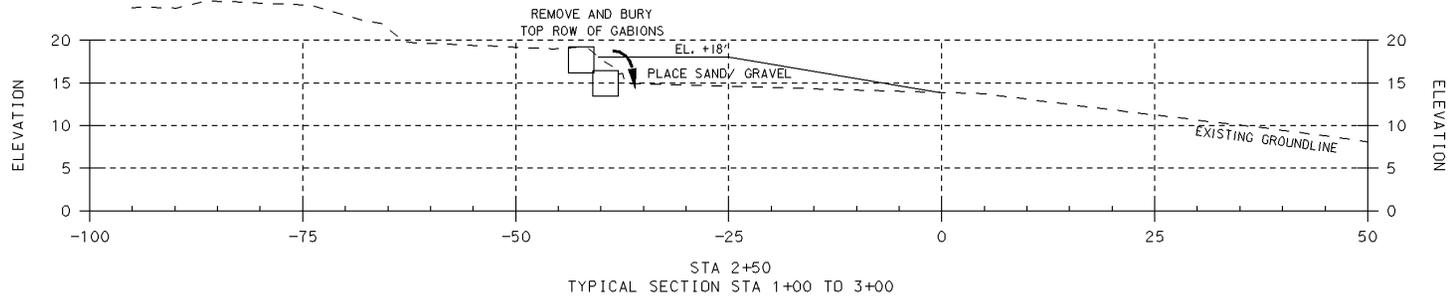
- NOTES:
- HORIZONTAL CONTROL IS BASED ON N.A. COORDINATE SYSTEM, NORTH ZONE, NAD-83/91.
  - VERTICAL CONTROL IS BASED ON MLLW (NOST).
  - CONTOUR INTERVAL IS 2'.
  - ELEVATIONS AND CONTOURS SHOWN ARE FROM A SURVEY CONDUCTED BY THE CORPS OF ENGINEERS IN OCT, 2002.
  - TO THE EXTENT PRACTICABLE, CONSTRUCTION EQUIPMENT SHALL REMAIN ABOVE AN ELEVATION OF +8' MLLW.
  - STA 1+00 - 3+00, BURY TOP ROW OF GABIONS IMMEDIATELY SEAWARD OF EXISTING LOCATION. COVER GABIONS WITH SAND/ GRAVEL.
  - STA 8+50 - 14+00, EXCAVATE AND RELOCATE TOP 1' OF PATH MATERIAL (EST. 250 CY CRUSHED ROCK) TO THE RELOCATED PATH BETWEEN STA 4+00 AND 8+60. PLACE EXCAVATED BACKFILL MATERIAL (APPROX. 350 CY) IN STOCKPILE AREA. PLACE AN ADDITIONAL 350 CY OF IMPORTED SAND/ GRAVEL IN STOCKPILE AREA. GRADE AS DIRECTED.
  - STA 3+00 - 14+00, EXCAVATE GABIONS AND TOE STONE. PLACE APPROX. 1300 CY OF EXCAVATED GABION STONE ON RELOCATED PATH. PLACE 850 CY OF EXCAVATED GABION STONE AND 185 CY OF EXCAVATED TOE STONE IN STOCKPILE AREA. REMOVE REMAINDER OF GABION AND TOE STONE FROM SITE.
  - HUMMOCK SHALL BE GRADED ONLY UNDER THE DIRECT SUPERVISION OF THE COR.
  - PRIOR TO PLACEMENT OF SAND/ GRAVEL, REMOVE SCATTERED TOE STONE (10" DIA.) LOCATED ABOVE EL. +2'.



U.S. ARMY ENGINEER DISTRICT, SEATTLE  
CORPS OF ENGINEERS  
Seattle, Washington

BURIEN, WA & VICINITY  
SEAHURST PARK SHORELINE REHABILITATION

DATE JUL 1, 2003	PUBLIC NOTICE CENWS-PL-02-06	SHEET 2 OF 3
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U.S. ARMY ENGINEER DISTRICT, SEATTLE CORPS OF ENGINEERS Seattle, Washington		
BURIEN, WA & VICINITY SEAHURST PARK SHORELINE REHABILITATION		
DATE JUL 1, 2003	PUBLIC NOTICE CENWS-PL-02-06	SHEET 3 OF 3

# APPENDIX F.

## CITY OF BURIEN STANDARD MAINTENANCE PRACTICES

# **Seahurst Park Standard Maintenance Practice**

## **Clean-up of Slide Materials**

The upland slopes surrounding Seahurst Park are seated on unstable soils and prone to experience shallow landslides approximately once every other year. Winter weather conditions saturate soils on the steep slopes exacerbating the condition by making the unstable slopes even more prone to minor slides. Most slides are small consisting of 10 to 100 yards of material. It is common for these small shallow landslides to incorporate trees and other woody materials into the slide.

Consistent with the effort to restore natural processes that create ideal marine habitat, the City of Burien will allow materials from landslides to remain on the beach where there exists no hazard to public use of the park. Where landslide materials interfere with the trail, maintenance access road or other appurtenant structures located in the backshore of the Southern beach, the City will restore public access by removing the slide materials. These materials, including large woody debris will be retained on site and deposited in the upper backshore, between the upper backshore at +15' MLLW but no lower than +11.6' MLLW (MHHW). The City will re-vegetate slide areas with native plant species as part of the City's ongoing effort to eliminate invasive plant species within the park.

This policy was developed with the understanding that slide materials and associated vegetation should be retained within the nearshore to nourish the beach with new sand, gravel and woody debris that create ideal habitat for salmon, eelgrass and forage fishes found naturally in the Puget Sound. In its effort to balance the benefits of public recreational access and environmental sensitivity, the City will make every effort to not interfere with the natural processes that support ideal marine habitat.