Draft Environmental Assessment

Seward Park Beach Nourishment Section 544

Lake Washington
King County, Washington
February 2005

US Army Corps
of Engineers®
Seattle District

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Responsible Agencies: The Seattle District U.S. Army Corps of Engineers (USACE) and the City of Seattle are the responsible agencies for this proposed project.

Summary: The proposed action is described in detail in the attached Environmental Assessment (EA). The purpose of this project is to enhance the nearshore substrate at Seward Park in Seattle, Washington in order to improve shoreline rearing habitat for juvenile Chinook salmon. This project is authorized under Section 544 of the Water Resources Development Act of 2000 (Public Law 106–541, Dec. 11, 2000), which supports critical ecosystem restoration projects. The USACE and the City of Seattle propose to improve the nearshore habitat for juvenile Chinook salmon by placing a layer of sand/gravel substrate over the existing quarry spall substrate. Recent studies in Lake Washington have determined that juvenile Chinook prefer sand and gravel substrate and tend to avoid larger substrate (cobble/boulder).

The proposed action will consist of placing approximately 3500 cubic yards (CY) of sand and gravel in a 1-foot thick layer over selected portions of the near shore bottom to cover angular quarry stone left over from previous erosion control projects. Approximately 400 CY each will be placed in two northern project areas and approximately 2700 CY will be placed in the southeastern project area. Material will be placed using a barge, conveyor, and distributing mechanism. Other project alternatives considered included the "No Action" alternative and the "Substrate Removal" alternative, but they were rejected because they did not meet project objectives and/or were more costly.

Potential impacts of the proposed work are described in this document. Impacts will generally be highly localized in nature, short in duration, and minor in scope. Impacts should not be significant either individually or cumulatively.

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ACRONYMS

CWA	Clean Water Act
CY	Cubic Yards
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
GI	Lake Washington Basin Restoration General Investigation Study
HPA	Hydraulic Project Approval
JARPA	Joint Aquatic Resources Permit Application
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
PCE	Primary Constituent Elements
PSAWR	Puget Sound and Adjacent Waters Restoration
WDFW	Washington Department of Fish and Wildlife
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1. INTRODUCTION

In July of 1999 the City of Seattle and King County initiated and co-sponsored the Lake Washington Basin Restoration General Investigation (GI) Study. The purpose of the GI is to evaluate water-related issues in the greater Lake Washington basin, which includes Lake Sammamish, Lake Washington, and the Cedar River. These issues involve improving salmonid migration and survival at the Hiram A. Chittenden Locks through water conservation and modification of facilities, and creating specific habitat improvements throughout the basin for fish and wildlife. This draft EA discusses beach nourishment at Seward Park on Lake Washington, a proposed action that supports the latter goal of habitat improvement. The proposed action would be a continuation of a demonstration project undertaken by the City of Seattle and the USACE in 2001.

Because the beach nourishment project involves the action of a federal agency, an EA is required in accordance with the National Environmental Policy Act of 1969 (Title 42 United States Code (USC), Chapter 55, Section 4321 et seq.); Title 40 Code of Federal Regulations (CFR), Chapter V, Sections 1500-1508; and USACE Environmental Regulation (ER) 200-2-2. This draft EA discusses the need for the beach nourishment project, the proposed action and alternatives considered, the environmental effects of the project, and the agencies and persons consulted.

1.1 Project and Action Areas

Seward Park is owned by the City of Seattle Parks Department and located in King County on the Bailey Peninsula in southwestern Lake Washington. The specific project areas are located on the southeastern and northern shores of Seward Park, as shown in Figure 1 below. The project areas occur in Sections 14 and 24 of Township 24 North, Range 4 East.

Figure 1. Map of Project Areas, Seward Park, WA [USGS, 2002]

The action area includes not only the proposed project areas, but also all surrounding areas that may be affected directly or indirectly by implementing the proposed action. For this project Seward Park and the surrounding waters are considered the action area.

1.2 Project Purpose and Need

The City of Seattle is interested in rehabilitating nearshore habitat within the park under the GI to improve juvenile Puget Sound Chinook salmon habitat. Unlike most cases, in which juvenile Chinook salmon rear in rivers and estuaries, juvenile Chinook salmon in Lake Washington are known to rear in littoral areas of the lake from January to early June [Tabor et al, 2004a]. Extensive urban development along the shores of Lake Washington and parts of Seward Park, however, has resulted in highly altered littoral areas, which may be contributing to the decline of Chinook salmon in Lake Washington. Previous protection measures implemented at Seward Park included a variety of small-scale bank protection and beach nourishment projects (e.g., small riprap, concrete, ornamental concrete walls, sand, gravel) with the intention of reducing the frequency and magnitude of shoreline erosion. In many cases, however, it appears that certain bank protection projects may have actually reduced nearshore habitat for fish and wildlife.

Piaskowski and Tabor found evidence that shoreline development and certain bank protection methods such as those found in Seward Park (e.g. riprapping, creating steep and/or deep shorelines with bulk heading) may create habitat that is avoided by juvenile Chinook salmon at night [Piaskowski and Tabor, 2001]. In several areas along the shoreline of Seward Park, quarry spalls used in such development projects have washed out into the nearshore habitat, creating an "armored" substrate. The type of substrate present is important for juvenile salmonids because it can provide cover, spawning, rearing, and feeding habitat. The quarry spall substrate does not provide quality habitat for juvenile Chinook salmon, but may instead provide good ambush habitat for several species of sculpins that prey upon juvenile salmon. Piaskowski and Tabor [2001] also found evidence in southern Lake Washington that juvenile Chinook tend to prefer sand and gravel substrate and avoid larger substrate (e.g., cobbles and boulders). In addition, chironomids, a major component of Chinook salmon prey, are most prevalent in “mucky” (as opposed to cobble) substrates found along natural shorelines [Koehler, undated]. Using this knowledge the USACE placed 1400 CY of sand and gravel at various nearshore areas around Seward Park in 2001 as a step toward improving rearing habitat for juvenile Chinook salmon.

The purpose of this project is to restore some of the natural shoreline features that existed in Lake Washington prior to 1916 and to continue enhancing the substrate at Seward Park by placing sand and gravel in order to improve rearing habitat for juvenile Chinook salmon. The substrate enhancement is anticipated to reduce predator hiding spots and to increase prey production. Habitat improvements are needed for the species’ survival because the Puget Sound Evolutionarily Significant Unit (ESU) of Chinook salmon was designated in 1999 as threatened under the Endangered Species Act (ESA) [NOAA, 2004].

1.3 Authority

The proposed project is authorized by Section 544 of the Water Resources Development Act of 2000 (Public Law 106–541, Dec. 11, 2000), which supports critical ecosystem restoration projects under the Puget Sound and Adjacent Waters Restoration (PSAWR) program. The PSAWR program supports projects that preserve, protect, and restore critical ecosystem processes, habitats, and functions within the Puget Sound basin.

2. ALTERNATIVES ANALYSIS

The following sections describe the three alternatives that were considered for the substrate enhancement work at Seward Park.

2.1 Place Sand and Gravel (Preferred Alternative)

The preferred alternative (i.e., the proposed action) will place approximately 3500 cubic yards (total) of sand and gravel in a one-foot-thick layer over the existing quarry spall substrate in the three nearshore areas shown above on Figure 1. The materials will be placed from shore out to a distance of approximately 30 feet. Each northern area is approximately 150 feet long and will receive approximately 400 cubic yards of sand and gravel. The southeastern area is approximately 1650 feet long and will receive approximately 2700 cubic yards of sand and gravel. In the northern segment of the southeastern area, the materials will be placed intermittently to cover only those areas where the substrate is currently quarry spalls. The materials will be brought in by barge, offloaded using a conveyor, and distributed using either a

rotating disk (as shown in cover photo) or a raking machine (as of this writing, the method of distribution has not yet been determined). Project construction is scheduled for August 16 to September 30, 2006, so that the work can occur within fish and bald eagle work windows to minimize any effects on salmonids and bald eagles.

The proposed action was selected from the alternatives for the following reasons:

- The proposed action will restore some of the natural shoreline features that existed in Lake Washington prior to 1916.
- The proposed action will meet the need to enhance juvenile Chinook salmon habitat along the shores of Seward Park.
- It is more cost effective than removing the quarry spalls first (see next alternative, Section 2.2).
- The proposed work is compatible with other ongoing environmental restoration and monitoring efforts by federal, state, and local agencies.
- The project will not interfere significantly with recreational navigation.
- The project will not interfere significantly with public visitation and enjoyment of the park.
- The project will not interfere with state and tribal fish management authorities.

2.2 Remove Quarry Spalls, Then Place Sand and Gravel

Under this alternative, the USACE would remove the existing quarry spall substrate prior to placing the sand and gravel substrate. Hydraulic excavators would be used to dig out the quarry spalls. This alternative was rejected because excavation would increase the cost of the project (relative to the preferred alternative) and would require reuse or disposal of the excavated material. In addition, excavation of the existing substrate would cause more disturbance to the aquatic environment than just placing sand and gravel over the existing substrate.

2.3 No Action

Under the "no action" alternative, the USACE would leave the nearshore habitat in its present condition. The no action alternative would be expectedly cheaper than the preferred alternative and would cause no short-term impacts (e.g, construction noise and air emissions). However, the no action alternative would also provide no benefit to juvenile Chinook salmon because no habitat improvement measures would be implemented. This alternative was rejected because it does not meet the need for improving juvenile Chinook salmon habitat in Lake Washington.

3. EXISTING ENVIRONMENT

The following sections discuss the current environmental status of the project area. Sections 4, 5, and 6 discuss the potential, adverse, and cumulative effects of the proposed action (and no action alternative), respectively.

3.1 Geology

Seward Park is a drumlin, a hilly shape formed by glacial activity and consisting of glacial till. Because glacial activity in the Pacific Northwest was relatively recent (i.e., the Ice Age ended approximately 10,000 years ago) [WSDNR, 2001], Seward Park has not yet developed deep,

fertile soil. As a result, the soil is difficult to cultivate and nearly impossible to infiltrate [SPR, 2005].

The present elevation of Lake Washington was established in 1916 when the Montlake Cut of the Lake Washington Ship Canal was opened. This action connected Lake Washington to Puget Sound and lowered the lake's elevation by about 9 ft. The lake's elevation is controlled by the USACE at the Hiram A. Chittenden Locks and fluctuates between approximately 20 feet (winter) and 22 feet (summer) [USACE, 2004]. The fluctuating elevation can cause some erosion along the Lake Washington shoreline.

3.2 Water Quality

Lake Washington is considered a mesotrophic lake, which means "moderately productive" based on common lake indices such as nutrients, algal biomass (chlorophyll-*a*), transparency, and hypolimnetic oxygen deficiency. The two major tributaries to Lake Washington are the Cedar River at the southern end and the Sammamish River at the northern end. Together, the rivers provide 84% of the hydraulic load to Lake Washington [KCDNRP, 2003]. Lake waters flow through Lake Union and the Lake Washington Ship Canal before reaching Puget Sound. The lake is monomictic, remaining strongly stratified from June to October, until mixing occurs in late fall.

A study conducted by King County in 2003 concluded that Lake Washington appears to be in stable ecological condition with respect to water quality now that it no longer receives secondary treated sewage (a practice stopped in 1963) [KCDNRP, 2003]. However, the lake continues to be sensitive to phosphorous loading. The key to maintaining water quality is ensuring that phosphorous input from the Cedar River (the largest source) remains low. Dissolved oxygen (DO) concentrations are generally at saturation in the epilimnion, a metric which is not as useful, however, as the dissolved oxygen concentrations in the hypolimnion (>25 meters / 82 feet). From May to October of 1993 to 2001 (the study period), hypolimnetic mean DO ranged from 7.7 to 8.9 mg/L, which is slightly less than the 9.5 mg/L set by the Washington State Department of Ecology (Ecology) for core rearing, migration, and spawning of salmon and trout [Ecology, 2003]. The temperature in the nearshore areas between the surface and 9 m (29.5 feet) exceeded 17.8ºC (64 F) from mid-July through early October most years, and was speculated to limit fish use of these areas at these times [KCDNRP, 2003].

3.3 Vegetation and Shoreline Characteristics

The Seattle Parks and Recreation Department recently developed a Vegetation Management Plan for Seward Park, but noted that defined management objectives for the various uses of Seward Park's shoreline do not yet exist [SPR, 2005]. As a result, there are competing interests such as recreation, habitat enhancement, and view corridors that currently influence vegetation management along the shoreline. The City has, however, conducted a shoreline study for the purposes of salmon habitat enhancement [Paron and Nelson, 2001]. This study determined that much of Seward Park's shoreline is armored with riprap or concrete, which does not provide suitable littoral habitat for juvenile salmonids. In addition, the study noted that only 18% of Seward Park's shoreline has overhanging vegetation, a feature which is needed to provide refuge and foraging opportunities for juvenile salmonids. Consequently, the City has implemented some vegetation restoration projects with the goals of increasing upper canopy shading along

outer edge of perimeter road (which encircles the park) and replacing invasive plant populations with natives [SPR, 2005].

The city's Vegetation Management Plan does define low, medium, and high shoreline vegetation quality for Seward Park based on canopy height, canopy distance over water, and presence of invasive species. A specific flowchart for making the determination of low, medium, or high quality can be found in Addendum F of the Plan [SPR, 2005]. The vegetation quality is considered medium in the two northern project areas and varies from low to medium in the southeastern project area. Although there is no canopy cover in the northern project areas, there is also little to no presence of invasive species. In the southeastern project area canopy cover exists and includes black cottonwood, Douglas fir, and Lombardy poplar, but there is also a more significant presence of invasive species such as Himalayan blackberry, reed canary grass, and yellow loosestrife.

Another invasive species in the nearshore areas of Lake Washington is Eurasian milfoil. Since its introduction in the 1970s, Eurasian milfoil has become one of the most problematic plants in Washington because it can colonize a lake rapidly and is extremely difficult to eradicate. It has many other negative aspects: it forms dense floating mats that can interfere with recreational activities such as swimming, fishing, water skiing, and boating; a large mass of plants can cause flooding, and stagnant mats may harbor mosquitoes; the mats can prevent oxygenation of deeper waters by preventing the wind from mixing down the oxygenated surface waters; the mats can alter water quality by raising pH, decreasing oxygen under the mats, and increasing temperature; the mats can also increase the sedimentation rate by trapping sediments; and, when the dense mats die and decay, they consume oxygen, which increases the biological oxygen demand in the water and reduces dissolved oxygen [Ecology, 2003a].

3.4 Fish

Over 50 anadromous and freshwater fish species are found within the Lake Washington basin, though more than 20 of these are non-native species that have been introduced into the basin during the last 140 years by agencies or private individuals. The anadromous salmonid species found in the basin include Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), sockeye salmon (*O. nerka*), coastal cutthroat trout (*O. clarki clarki*), and steelhead (*O. mykiss*). In addition, Coastal-Puget Sound bull trout (*Salvelinus confluentus*) may occasionally be found in the Lake Washington Basin. Salmonids are considered a "keystone" species that support both producers and consumers in the food chain. There are two permanent salmonid hatcheries in the basin: the Issaquah Creek hatchery run by the Washington Department of Fish and Wildlife (WDFW), and the University of Washington hatchery at the head of the Ship Canal. These hatcheries currently raise coho and Chinook salmon.

Table 1 below lists the variety of anadromous and freshwater fish that can be found in the Lake Washington basin [USACE, 2001; WDFW, 2005].

Table 1. Fishes of Lake Washington Basin

Primary Habitat	Common Name	*Scientific Name*	Life-History Strategy
Native species	**Western brook lamprey**	*Lampetra richardsoni*	Stream resident
	Pacific lamprey	*Lampetra tridentatus*	Anadromous
	River lamprey	*Lampetra ayresi*	Anadromous
	White sturgeon	*Acipenser transmontanus*	Anadromous
	Pygmy whitefish	*Proposium coulteri*	Adfluvial
	Mountain whitefish	*Proposium williamsoni*	Fluvial
	Cutthroat trout	*Onchorhynchus clarki clarki*	Anadromous, adfluvial, resident
	Steelhead and Rainbow trout	*Onchorhynchus mykiss*	Anadromous, adfluvial, resident
	Dolly Varden	*Salvelinus malma*	Anadromous
	Bull trout	*Salvelinus confluentus*	Adfluvial, Anadromous
	Coho salmon	*Onchorhynchus kisutch*	Anadromous
	Chinook salmon	*Onchorhynchus tshawytscha*	Anadromous
	Sockeye salmon and kokanee	*Onchorhynchus nerka*	Anadromous, adfluvial, resident
	Chum salmon	*Onchorhynchus keta*	Anadromous
	Pink salmon	*Onchorhynchus gorbuscha*	Anadromous
	Longfin smelt	*Spirincus thaleichthys*	Anadromous, adfluvial
	Resided shiner	*Richardsoni balteatus*	Resident
	Longnose dace	*Rhinichthys cataractae*	Resident
	Speckled dace	*Rhinichthys osculus*	Resident
	Northern squawfish	*Ptychocheilus oregonensis*	Lake resident
	Peamouth chub	*Mylocheilus caurinus*	Lake resident
	Largescale sucker	*Catastomus macrocheilus*	Resident
	Three-spine stickleback	*Gasterosteus aculeatus*	Resident
	Coast range sculpin	*Cottus aleuticus*	Resident
	Shorthead sculpin	*Cottus confuses*	Resident
	Torrent sculpin	*Cottus rotheus*	Stream resident
	Prickly sculpin	*Cottus asper*	Resident
	Riffle sculpin	*Cottus gulosus*	Stream resident
	Reticulate sculpin	*Cottus perplexus*	Resident
	Olympic mudminnow	*Nobumbra hubbsi*	Stream resident
Non-native species	**American shad**	*Alosa sapidissima*	Anadromous
	Lake whitefish	*Coregonus clupeaformis*	Lake Resident
	Brown trout	*Salmon trutta*	Anadromous, adfluvial
	Atlantic salmon	*Salmon salar*	Anadromous
	Brook trout	*Salvelinus fontinalis*	Stream resident
	Lake trout	*Salvelinus namaycush*	Lake Resident
	Cherry salmon	*Onchorynchus masou*	Anadromous
	Weather loach	*Misgurnus angillicaudatus*	Lake resident
	Common carp	*Cyprinus carpio*	Lake resident
	Grass carp	*Ctenopharengodon idella*	Lake resident
	Goldfish	*Carassius auratus*	Stream or lake resident
	Tench	*Tinca tinca*	Lake resident
	Channel catfish	*Ictalurus punctatus*	Lake resident
	Brown bullhead	*Ameiurus nebulosus*	Lake resident

Table 1 continued

Primary Habitat	Common Name	*Scientific Name*	Life-History Strategy
	Black bullhead	*Ameiurus melas*	Lake resident
	Largemouth bass	*Micropterus salmoides*	Stream or lake resident
	Smallmouth bass	*Micropterus dolomieui*	Stream or lake resident
	Black crappie	*Pomoxis nigromaculatus*	Lake resident
	White crappie	*Pomoxis annularis*	Lake resident
	Warmouth	*Lepomis gulosis*	Lake resident
	Bluegill	*Lepomis machrochirus*	Lake resident
	Pumpkinseed sunfish	*Lepomis gibbosus*	Lake resident
	Yellow perch	*Perca flavescens*	Lake resident

3.5 Wildlife

3.5.1. Mammals

Seward Park supports an array of small wildlife species such as mountain beaver, raccoon, deer mice, and squirrel, and the forest shores may be visited by muskrats, beaver, and river otters [Talbert, undated].

3.5.2. Birds

The park offers a variety of aquatic and terrestrial habitats for birds. Diving ducks, western grebes, coots and glaucous-winged gulls are often seen on the open lake, while great blue herons, pied-billed grebes, double crested cormorants and kingfishers are seen more frequently on sheltered Andrews Bay. Red-winged blackbirds are found in the marshes, while downy woodpeckers favor the Lombardy poplars planted along the lakeshore. Robins, starlings, crows and Canada geese frequent the lawns. Western tanagers, song sparrows and chickadees are often seen in the more open wooded and shrubby areas in the southern part of the park. The mature forest is home to pileated woodpeckers, Steller's jays, winter wrens, western screech-owls and red-breasted nuthatches [Talbert, undated(a)].

Many birds are resident all year long, while others visit seasonally. Among the year-round residents are mallards, pied-billed grebes, great blue herons, western screech owls, crows, Steller's jays, chickadees, nuthatches, bushtits, woodpeckers, wrens, song sparrows and towhees. Summer visitors include ospreys, rufous hummingbirds, western tanagers, swallows, warblers and Swainson's thrushes. Greater white-fronted geese and migratory Canada geese pass through the park in the spring and fall. Many kinds of waterfowl are winter visitors, including double-crested cormorants, common loons and most kinds of grebes, gulls and ducks. Varied thrushes and dark-eyed juncos also come from the mountains to the lowlands for the winter [Talbert, undated(a)].

3.6 Threatened and Endangered Species

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (Title 16 USC, Chapter 35, Section 1536(a)2), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Several threatened or endangered species that may be found in or near the proposed project area are listed below in Table 2 and discussed thereafter.

Table 2. Listed Species and Habitat Potentially Occurring in the Project Vicinity

Species	Listing Status	Critical Habitat
Bald Eagle *Haliaeetus leucocephalus*	Threatened	None
Coastal-Puget Sound Bull Trout *Salvelinus confluentus*	Threatened	Proposed
Puget Sound Chinook Salmon *Oncorhynchus tshawytscha*	Threatened	Proposed

3.6.1. Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is a federally listed threatened species and a "State Threatened" species in Washington [Watson and Rodrick, 2004]. Two active bald eagle nests are located within Seward Park [Stofel, 2005]. The northern nest is approximately 700 feet from the northeastern proposed project area. The southern nest is approximately 750 feet from the closest shore of the southeastern project area, but is also only 300 feet from the nearest picnic shelters [WDFW, 2004]. The USFWS has not designated critical habitat for bald eagles.

3.6.2. Coastal-Puget Sound Bull Trout

The Coastal-Puget Sound bull trout was listed as threatened under the ESA in 1999. Unique to this population segment is its amphidromous life strategy, which means it transitions from marine to fresh water several times before spawning in fresh water [FR, 2004]. Bull trout, which tend to prefer cooler habitats than other salmonids, typically exist in streams below 59 degrees Fahrenheit and spawn from August to November in even cooler waters [USFWS, 2004]. Since Lake Washington's summer temperatures can easily exceed 65 degrees (down to approximately 25 feet) [KCDNRP, 2004] and the project is scheduled to occur in August and September, it is unlikely that bull trout will be found in the warm, shallow, project area waters.

Lake Washington does provide overwintering, foraging, and migration habitat for bull trout and has been proposed as critical habitat for bull trout [FR, 2004; USFWS, 2004]. Although Lake Washington has been proposed as critical habitat, it has not yet been incorporated into a "core area" of the U.S. Fish and Wildlife Service (USFWS) Puget Sound Management Unit. Core areas consist of core habitat that contains, or if restored would contain, all of the essential physical elements to provide for the security of and to allow for the full expression of the life history forms of one or more local populations of bull trout [USFWS, 2004].

3.6.3. Puget Sound Chinook Salmon

The ESU of Puget Sound Chinook salmon was listed as threatened under the ESA in 1999 [NOAA, 2004]. This ESU encompasses all runs of chinook salmon in the Puget Sound region from the North Fork Nooksack River to the Elwha River on the Olympic Peninsula [Myers et al, 1998]. The Water Resources Inventory Area (WRIA) 8 (managed by Ecology) encompasses the Lake Washington/Cedar/Sammamish watershed. A conservation plan for the Chinook salmon, developed by the WRIA 8 Steering Committee, has identified three populations for conservation planning in WRIA 8: the Cedar River population, the North Lake Washington population, and the Issaquah population [WRIASC, 2005]. These Chinook populations are considered unique

from other populations in the Puget Sound ESU because they are the only ones that use a lake for rearing and migration.

The Chinook salmon that migrate through Lake Washington are considered "ocean-type" (as opposed to stream-type), because juveniles migrate to the ocean within their first year [Tabor et al, 2004a; Myers et al, 1998]. Adult Chinook salmon are known to migrate through Lake Washington generally between July and September on their journey upstream to spawn in the Cedar River, Bear Creek, or Issaquah Creek. Juvenile Chinook salmon, on the other hand, are known to migrate through Lake Washington generally between January and July on their way to the ocean [Tabor et al, 2004a].

With regard to abundance, the number of adult Chinook salmon from the Cedar River population returning to spawn in the Cedar River has been declining in recent years, from approximately 1550 returning fish in 1987 to roughly 600 in 2004. The number of adult Chinook salmon from the North Lake Washington returning to spawn in Bear Creek has also been very low in recent years, with only approximately 400 fish returning between 1985 and 1999. Only the Issaquah population appears to be relatively healthy, with an average of 3,000 fish returning to spawn between 1986 and 1999. However, the Issaquah population is also supported by hatchery fish [WRIASC, 2005]. The declining numbers of the former populations can be attributed to habitat degradation, loss of life history diversity, unfavorable ocean conditions, and over-harvesting.

Because Chinook salmon numbers have been declining, studies have been undertaken to better understand their habitat needs. A study conducted by Tabor et al [2004] has determined that the south end of Lake Washington is an important rearing area for juvenile Chinook salmon. Lake Washington has been designated as critical habitat for Chinook salmon (FR 2005b). Primary constituent elements of Chinook critical habitat that could apply to the project area include adequate freshwater rearing sites and suitable migration corridors.

Lake Washington has also been designated by the Pacific Fishery Management Council as Essential Fish Habitat (EFH) for Chinook salmon. Important features of EFH for spawning, rearing and migration include substrate composition; water quality; water quantity, depth and velocity; channel gradient and stability; food; cover and habitat complexity; space; fish access and passage; and flood plain habitat and connectivity [PFMC, 1999]. Since over 70% of Lake Washington's shores are residential and armored with riprap or bulkheads [Tabor et al, 2004a], the shores of Seward Park are some of the few areas where many of these PCE and EFH features are available.

3.7 Historic, Cultural, and Native American Resources

Past researchers have placed the project area and Lake Washington within the territory of the Duwamish, a Lushootseed (Puget Salish) speaking group who lived in the vicinity of present day Seattle. The Duwamish belonged to the Nisqually dialectic group of the Coast division of the Salishan linguistic stock (Swanton 1952:423). Swanton cites Smith (1940) in attributing the Duwamish to the river of the same name and defined five subdivisions, one of which was centered around Lake Washington. The Bureau of Indian Affairs map of 1978, depicting "Indian Land Areas Judicially Established," shows the Duwamish Tribe ceded lands as extending across much of the present day greater Seattle and Lake Washington area (Docket Number 166). The

city was named after the great Duwamish leader, Chief Seattle, who signed the Point Elliot Treaty in 1855. After the treaty was signed the Duwamishes were removed from their traditional lands and a long period began of being forced to move from one location to another. Some Duwamishes settled on the Muckleshoot and the Suquamish (Port Madison) Indian Reservations.

Some Duwamishes fled the Suquamish Reservation and returned to their traditional territory and as late as 1910 there was a Duwamish village at Foster, along the Duwamish River south of the Seattle city center. Foster is located at the northern end of a stretch of the Duwamish River Valley that contained geographic features associated with the North Wind and South Wind myth and was considered a sacred area to the Duwamish Tribe and other Native Americans in the Puget Sound region. Many Duwamishes are presently scattered around their traditional territory and continue to work on establishing themselves as a Federally recognized tribe (Ruby and Brown 1992:72-73).

King County HistoryLink (Brighton Beach Thumbnail History, 8 February 2006) provided information that the members of the Duwamish tribe on Lake Washington "established a permanent winter camp of several cedar long houses just south of Bailey Peninsula." HistoryLink (Lakewood Thumbnail History, 8 February 2006) states that "Lakewood's and Seward Park's first residents were Native Americans of the Duwamish Tribe who lived along the shore of Lake Washington….but the tribe does not appear to have established a permanent camp there." An examination of the General Land Office (GLO) maps of 1862 and 1863 for T. 24 N., R. 4 E., within which the project area is located, did not show any homesteads, structures or roads in the vicinity.

3.8 Land Use / Recreation

Seward Park was established in 1911 when the City of Seattle purchased the land as part of its plan for a comprehensive park system. Today, the park is extremely popular and supports an art studio, an environmental learning center, swimming areas and beaches, a native plant garden, an amphitheater, walking and biking trails, picnic areas and shelters, playground equipment, and tennis courts. The park also contains what is known as the "magnificent forest," the largest stand of old trees in the city, covering nearly 120 acres and containing trees nearly 200 years old [Talbert, undated]. Boaters and kayakers are frequently seen in Lake Washington and around Seward Park. The specific project areas may be used by swimmers, waders, boaters, and kayakers who use the nearshore areas to move between water and shore.

3.9 Air Quality and Noise

Air quality in the Puget Sound region met all National Ambient Air Quality Standards for criteria pollutants in 2003 (the most recent report available) [PSCAA, 2004]. Real-time data for Puget Sound can be obtained from local monitoring stations [PSCAA, 2005]. The level of noise within the project areas (assuming no construction activities) is caused mostly by the presence of pleasure boats and passengers.

3.10 Transportation

The sand and gravel needed for the proposed action will be transported to the site by barge and tugboat and distributed using a conveyor. Construction workers will likely arrive on site by car or truck.

3.11 Aesthetics

Seward Park is one of the most aesthetically pleasing locales in the city, containing a beautiful urban forest, scenic trails and swimming areas, and stunning views of Mt. Rainier. The urban forest provides a peaceful haven from the stresses of city life, and shores of the park allow visitors to view and enjoy the waters of Lake Washington.

3.12 Socio-Economics

Seward Park exists in a relatively affluent neighborhood of Seattle (see Section 9.9) and is used primarily for recreation. Very little income is generated at the park, though the Seward Park Art Studio occasionally sells pottery to the public as a fundraiser for the studio. No significant social or economic issues are of concern in the proposed project areas.

3.13 Hazardous and Solid Waste

No known hazardous or solid waste is stored or evident in the immediate vicinity of the proposed project areas. It is unlikely that any measurable contamination has been introduced to or has accumulated in the project areas either (other than trash), since the park has been in existence for nearly 100 years.

4. ENVIRONMENTAL EFFECTS OF THE ALTERNATIVES

The following sections discuss the potential environmental effects of the proposed action and the no action alternative. The "remove quarry spalls" alternative was eliminated from consideration for reasons discussed in Section 2.2. Although the no action alternative was also eliminated from consideration, it has been carried through the alternatives analysis to provide a baseline to which the proposed action can be compared.

4.1 Hydrology and Geology

Both the no action alternative and the proposed action would have no effect the hydrology or geology of the project and action areas.

4.2 Water Quality

The no action alternative would have no effect on water quality.

The proposed action should not have any long-term effects on the water quality characteristics of Lake Washington as described in Section 3.2. The proposed action is not expected to contribute phosphorous to the water column, decrease hypolimnetic DO, or adjust temperature. The only exception to temperature could be if the sand and gravel were to sit in the sun for an extended period of time. Heat transfer from the warm sand and gravel to the cooler water could occur as the materials are placed; however, because the amount of material placed would be small in relation to the amount of water in Lake Washington, any temperature increase would be expected

to be negligible. The proposed action will likely increase in turbidity in the project areas, but the increases are expected to be temporary and will be closely monitored. To minimize the spread of turbidity, silt curtains will be deployed around the project areas.

4.3 Vegetation and Shoreline Characteristics

The no action alternative would have no effect on vegetation or shoreline characteristics.

If vegetation is growing up through the current quarry spall substrate, then the proposed action may smother this vegetation. However, given the dense clusters of quarry spall substrate, it is unlikely that much vegetation can penetrate this substrate to grow successfully.

4.4 Fish

The no action alternative would have no effect on fish.

The proposed action is designed to improve juvenile Chinook salmon habitat through substrate enhancement. This substrate enhancement may benefit other fish as well, if they also prefer sand and gravel substrate for rearing.

According to fish surveys completed in 2000, the timing of the proposed action (late summer/early fall) would occur when historically very few fish are present [Paron and Nelson, 2001]. However, if fish were present in the project areas, then the proposed action may have some temporary effects. The placement of new substrate may temporarily degrade water quality by increasing turbidity and possibly lowering dissolved oxygen, and may potentially displace fish species. Should fish coincidentally be present in the substrate placement area, it is highly likely that these fish would remove themselves from the area immediately once placement begins. The fish could then re-enter the area once operations cease and suspended sediments are settled.

The use of a barge to transport and store material would temporarily shade the water column and create wake. The effects of wakes are felt to a depth of about five feet; beyond this depth, the wake energy is significantly attenuated [USACE, 2001]. Because most fish are expected to be in the cooler waters of Lake Washington in the summer (well below five feet), the wake is not expected to disturb most fish. All effects would be temporary and would cease after construction ends.

Implementing the preferred alternative may have adverse effects on invertebrate species (i.e., fish food sources) within the immediate project areas, because placement of the sand and gravel in a one-foot thick layer may bury immobile invertebrates. However, the new substrate is expected to encourage production of chironomids, a major component of Chinook salmon prey that are most prevalent in “mucky” (as opposed to cobble) substrates found along natural shorelines [Koehler, undated].

4.5 Wildlife

The no action alternative would have no effect on wildlife.

The proposed action would have no effect on local wildlife other than a temporary noise disturbance as sand and gravel is unloaded from the barge. This disturbance is expected to be insignificant.

4.6 Threatened and Endangered Species

4.6.1. Bald Eagle

The no action alternative would have no effect on bald eagles.

Possible direct effects of the proposed action on bald eagles could include noise disturbance from the project machinery and temporary feeding disruption if the eagles are accustomed to using the specific project areas for feeding. However, since the shore areas already have a high potential for pedestrian, swimming, and boating disturbances, the project disturbances are not expected to significantly exceed what already exists. The proposed action will not alter nesting, perching, or roosting habitat, since no trees will be removed in the action area. No negative indirect effects of the proposed action on the bald eagle have been identified; on the contrary, if the proposed action were to foster increased Chinook salmon populations, the project may have a beneficial indirect effect on bald eagles by increasing their preferred food supply.

The project is scheduled to occur between August 16 and September 30, 2006 to avoid bald eagle wintering and nesting seasons (approximately late October through mid-August) [Watson and Rodrick, 2004]. Since the proposed action will not alter nesting, perching, foraging, or roosting habitat, or occur during nesting or wintering seasons, the proposed action is expected to have no effect on bald eagles.

4.6.2. Coastal-Puget Sound Bull Trout

The no action alternative would have no effect on bull trout.

Since the water in the project areas is expected to be warm when the proposed action is undertaken, no bull trout are anticipated to be present. In the unlikely event that bull trout were present, effects as discussed in Section 4.4 would apply. The proposed sand and gravel placement could cause a temporary increase in turbidity that could directly disturb bull trout. The placement may also temporarily scatter prey for juvenile migratory trout, who feed on terrestrial and aquatic insects, macrozooplankton, and small fish [USFWS, 2004]. However, the proposed project will not involve any work that could destroy or alter bull trout habitat by dredging, diversion, in-water vehicle operation or rock removal. It will also not involve any work that could alter riparian cover, temperature, or migratory corridors used by bull trout for foraging, cover, or migration. No indirect effects on bull trout are anticipated from the proposed action.

The project is scheduled to occur within the work window for bull trout (July 16 to December 31) to minimize any possible disturbances to bull trout [Ecology, 2004]. Water quality monitoring will be conducted during construction for turbidity and dissolved oxygen to ensure that no adverse effects to fish occur. The project areas will also be monitored for the presence of distressed or dying fish. Should any be observed, or if water quality parameters are exceeded, work will cease until the Corps project manager determines that it is safe to continue.

Since bull trout are unlikely to be in the project area and the proposed work will not alter riparian habitat, the proposed action has been determined not likely to adversely affect bull trout or its proposed critical habitat.

4.6.3. Puget Sound Chinook Salmon

The no action alternative would have no effect on Chinook salmon, and would provide no benefit to juvenile Chinook salmon because no habitat improvement measures would be implemented.

Since the proposed action will occur in August and September (2006), it is anticipated that Chinook salmon in the project area (if any) would be adults rather than juveniles. Furthermore, like bull trout, Chinook salmon prefer to inhabit water with cooler temperatures (e.g., 53-57 degrees Fahrenheit) [Paron and Nelson, 2001] than can be expected in Lake Washington during the summer (over 65 degrees Fahrenheit). Snorkeling surveys conducted along the shores of Seward Park in July and August of 2000 found no Chinook salmon [Paron and Nelson, 2001]. As a result, it is unlikely that Chinook salmon will be present in the project areas during construction. In the unlikely event that Chinook salmon were present, effects as discussed in Section 4.4 would apply. The proposed sand and gravel placement could cause a temporary increase in turbidity that could directly disturb Chinook salmon. However, the purpose of proposed project is to improve the substrate for juvenile Chinook salmon. The placement of sand and gravel is anticipated to discourage the presence of predatory fish (by covering their preferred quarry spall habitat) and to increase prey sources (e.g., chironomid larvae) for Chinook salmon [Paron and Nelson, 2001].

The project is scheduled to occur within the work window for Chinook salmon (July 16 to December 31) to minimize any possible disturbances to Chinook salmon [Ecology, 2004]. Water quality monitoring will be conducted during construction for turbidity and dissolved oxygen to ensure that no adverse effects to fish occur. The project areas will also be monitored for the presence of distressed or dying fish. Should any be observed, or if water quality parameters are exceeded, work will cease until the Corps project manager determines that it is safe to continue.

Since Chinook salmon are unlikely to be present during construction and because the project is expected to enhance (rather than disturb) juvenile Chinook salmon habitat, the proposed action has been determined not likely to adversely affect Chinook salmon or its proposed critical habitat.

4.7 Historic, Cultural, and Native American Resources

The Corps has determined that the proposed project is an undertaking of the type that could affect historic properties and must comply with the requirements of Section 106, as amended through 2004, of the National Historic Preservation Act of 1966, as amended through 2000 (NHPA) (16 USC 470). Section 106 requires that Federal agencies identify and assess the effects of Federal undertakings on historic properties and to consult with others to find acceptable ways to resolve adverse effects. Properties protected under Section 106 are those that are listed or are eligible for listing in the National Register of Historic Places (NRHP). Eligible properties must generally be at least 50 years old, possess integrity of physical characteristics, and meet at least

one of four criteria for significance. Regulations implementing Section 106 (36 CFR Part 800) encourage maximum coordination with the environmental review process required by the National Environmental Policy Act (NEPA) and with other statutes. The Washington State Archaeological Sites and Resources Act (RCW 27.53) may also apply.

The APE consists of the three discontiguous lake bottom areas where beach nourishment is proposed. To comply with Section 106 of the NHPA, a Corps archaeologist conducted a search of the (DAHP) electronic historic sites inventory database, other background and archival research, and a pedestrian survey of the project area shoreline adjacent to the APE with negative results. No properties listed in the National Register and no sites or structures listed in the state inventory were found to have been previously recorded within the APE. The Corps sent letters to the Muckleshoot Tribe, the Suquamish, and the Yakima Nation soliciting any knowledge or concerns or religious significance for the APE and has not received any information as of the date of this document.

4.8 Land Use / Recreation

The no action alternative would have no effect on land use or recreation in the project areas.

The proposed action would temporarily prevent people from boating, kayaking, swimming, or wading in the immediate project areas due to placement of the barge and distribution of the sand and gravel. However, recreation could resume as soon as construction is complete.

4.9 Air Quality and Noise

The no action alternative would have no effect on air quality or noise.

The proposed action could include a temporary decrease air quality due to emissions from the tug and barge, construction equipment, and vehicles of construction personnel. Also, the proposed action will temporarily increase noise levels in the project areas which may disturb birds, mammals, and park visitors. However, these effects are expected to be short-term and localized, and therefore have no significant impact on the project or action areas.

4.10 Transportation

The no action alternative would have no effect on transportation.

Since the proposed action would require construction and oversight personnel, there may be an additional demand for parking spaces during construction. However, this extra demand for parking spaces would be short-term and therefore have little effect on transportation at the park. Transportation of the barge to and from the site may temporarily affect pleasure boating patterns in Lake Washington, however, the disturbance is expected to be very minor and have no measurable effect on boating activities.

4.11 Aesthetics

The no action alternative would have no effect on aesthetics.

The proposed action would temporarily disturbance the aesthetic views and sounds of the lake while the construction equipment is in place and working. However, the completed project may improve the aesthetics of the nearshore waters if the enhanced substrate encourages the presence of more juvenile Chinook salmon. Many people enjoy the chance to view wild creatures in relatively natural setting.

4.12 Socio-Economics

The no action alternative would not implement any habitat improvement measures for juvenile Chinook salmon. As a result, opportunities to improve Chinook salmon runs, which might eventually benefit regional economics, would be foregone.

The proposed action would implement habitat improvement measures for juvenile Chinook salmon, which could eventually benefit regional economics if the numbers of Chinook salmon in the Lake Washington basin were to increase. The proposed project should have positive local economic effects because local contractors will be hired to perform the work, materials will be purchased from local quarries and other local suppliers, and services and facilities (e.g., restaurants) in the neighborhoods surrounding Seward Park will be used in support of the effort.

4.13 Hazardous and Solid Waste

No hazardous waste is expected to be generated during the proposed substrate enhancement work. Any solid waste (i.e., garbage generated during the day) will be removed from the site and disposed or recycled as appropriate.

5. UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects that will occur as a result of the proposed action include 1) a temporary decrease in air quality due to emissions from the tug and barge, construction equipment, and vehicles of construction and oversight personnel; 2) a temporary increase in noise levels in the park; 3) additional demand for parking by construction and oversight personnel; 4) temporary turbidity as sand and gravel is placed; and 5) disturbance to subsurface aquatic organisms that may be present on the quarry spall substrate. These effects are expected to be insignificant, however, because they will be temporary, minor, and localized in nature.

To minimize the occurrence of adverse environmental impacts during and after completion of the proposed project, the following construction measures will be implemented:

- Monitoring for bald eagles will occur during construction to ensure that no harassment occurs;
- Best management practices (such as slow placement of material and water quality monitoring) will be used to ensure that no unnecessary water turbidity occurs; and
- Work will only occur during fish and bald eagle work windows.

6. CUMULATIVE IMPACTS

Cumulative impacts are environmental impacts that may occur when the impacts of the proposed action are added to other past, present, and reasonably foreseeable future actions of any federal or non-federal entity. In other words, the goal is to predict what additional environmental

impacts may occur when the impacts of this project are analyzed in combination with the actions of others.

Past actions at Seward Park to enhance fish habitat included placement of sand and gravel by the USACE at the northeastern corner of the park in 2001. In concert with those efforts, the City of Seattle also planted native species along the modified lake edge to provide beneficial overhanging littoral vegetation [SPR, 2005]. The proposed action is a continuation of fish habitat improvements, and cumulative impacts from the proposed action (noise, emissions, parking disruptions, etc.) are expected to be minor, temporary and insignificant. Reasonably foreseeable future actions at the site could include additional substrate enhancement by the USACE and vegetation planting by the City of Seattle if future monitoring indicates that the substrate enhancement has been successful (as evidenced by increase prey production and greater numbers of juvenile Chinook salmon). Since this project is designed to benefit juvenile Chinook salmon, the proposed action is expected to have beneficial rather than adverse cumulative impacts.

7. TREATY RIGHTS

The Muckleshoot and Suquamish Tribes, within the boundaries of their usual and accustomed fishing areas, are co-managers with the WDFW of the fishery resources within the Lake Washington watershed. Specific fishing areas for the Suquamish include Shilshole Bay below the Locks, Elliot Bay, and the Duwamish estuary (up to the Spokane Street Bridge). Specific fishing areas for the Muckleshoot include Shilshole and Elliot Bay; Area 10 (a catch reporting area) and all saltwaters of Puget Sound; Lake Washington; Lake Sammamish; and the Cedar, Green and Puyallup/White Rivers. The Muckleshoot Tribe has been a leading proponent of salmon protection and recovery efforts within the Lake Washington basin.

As co-managers of anadromous fish resources, the Muckleshoot are directly involved in the City of Seattle's operation of water management activities in the Cedar River. Technical staff represent the Tribe each year during pre-season forecasting, refill, and flow augmentation coordination. Muckleshoot and Suquamish tribal staff have been involved in planning studies and fish and wildlife management activities within the Ship Canal.

The proposed action will not affect treaty rights and is expected to have a beneficial effect on juvenile Chinook salmon.

8. ENVIRONMENTAL COMPLIANCE

8.1 National Environmental Policy Act (42 USC 4321 et seq.)

This draft EA has been prepared in accordance with the National Environmental Policy Act of 1969, which requires federal agencies to discuss the potential environmental impacts of their projects and to solicit public comment. This EA discusses the need for the substrate enhancement project, the proposed action and alternatives considered, the environmental effects of the project, and the agencies and persons consulted. Any comments or concerns received on the draft EA will be addressed in the final EA.

8.2 Endangered Species Act (16 USC 1531-1544)

Section 7(a)(2) of the Endangered Species Act of 1973, as amended, requires federally funded, constructed, permitted, or licensed projects to take into consideration impacts to federally listed or proposed threatened or endangered species. A Biological Evaluation was prepared by the USACE and was sent to the USFWS and NOAA December 2005. The USACE is currently awaiting concurrence on its determinations.

8.3 Clean Water Act Compliance (33 USC 1251 et seq.)

Ecology has determined that an individual 401 Water Quality Certification is not required provided the Corps complies with water quality standards outlined in WAC 90.48 Water Pollution Control.

8.4 Coastal Zone Management Act (16 U.S.C. 1451-1465)

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 state coastal zone management program. This project will comply with the Washington Coastal Zone Management Program and will be conducted in a manner consistent with that Program.

8.5 Clean Air Act As Amended (42 USC 7401 et seq.)

The Clean Air Act requires states to develop State Implementation Plans (SIP), which document strategies for eliminating or reducing the severity and number of violations of National Ambient Air Quality Standards (NAAQS) while achieving expeditious attainment of the NAAQS. The act also requires federal actions to conform to the appropriate SIP. An action that conforms with a SIP is defined as an action that will not: 1) cause or contribute to any new violation of any standard in any area; 2) increase the frequency or severity of any existing violation of any standard in any area; or 3) delay timely attainment of any standard or any required interim emission reduction or other milestone in any area.

The USACE does not expect the proposed action to exceed EPA's *de minimis* threshold levels of 100 tons/year for carbon monoxide and 50 tons/year for ozone (40 CFR 93.153(b)). In addition, real-time air quality in Beacon Hill and Bellevue, Washington (the closest monitoring stations to Seward Park) can be obtained through the Puget Sound Clean Air Agency [PSCAA, 2005].

8.6 National Historic Preservation Act (16 USC 470 et seq.)

In accordance with Section 106 of the NHPA, the Corps has determined that the proposed Seward Park Nourishment Section 544 Project will not affect any historic properties.

If, during construction activities, the Contractor observes items that might have historical or archeological value, such observations shall be reported immediately to the Contracting Officer so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in the destruction of these resources and shall prevent his employees from trespassing on, removing, or otherwise damaging such resources.

8.7 Water Resources Development Act (33 USC 2263)

The proposed project is authorized by Section 544 of the Water Resources Development Act of 2000 (Public Law 106–541, Dec. 11, 2000), which supports critical ecosystem restoration projects under the Puget Sound and Adjacent Waters Restoration (PSAWR) program. The PSAWR program supports projects that preserve, protect, and restore critical ecosystem processes, habitats, and functions within the Puget Sound basin. The proposed project supports critical ecosystem restoration and therefore is in compliance with this act.

8.8 Executive Order 12898, Environmental Justice

Executive Order 12898 directs every federal agency to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low-income populations.

The neighborhoods surrounding Seward Park—Columbia City, Mount Baker, and Rainier Beach—contain a diverse range of incomes and ethnicity. Using data from the 2000 U.S. Census, the Seattle Post-Intelligencer newspaper reported the following statistics for these three neighborhoods [SPI, undated]:

Table 3. Census Data for Seward Park Neighborhoods

	Columbia City	Mount Baker	Rainier Beach
Population	12,121	5,717	12,367
Median household income ($)	42,250	53,447	25,150
Racial breakdown (%)			
White	28	52	33
Black	29	23	27
American Indian/Alaska Native	1	1	2
Asian	28	18	31
Hispanic/Latino	7	2	2
Other	7	4	5

The area immediately surrounding Seward Park is predominantly residential and more affluent than the outlying neighborhoods. A brief survey of data from the King County Assessor's office indicated that homes near the park have assessed values from $340,000 to over $1,000,000 [KC, 2005].

The proposed substrate enhancement project does not involve siting of a facility that would discharge pollutants that could affect human or environmental health. The proposed project will not negatively affect property values in the area or stigmatize local residents in any way. Construction activities are also not expected to interfere with local Native American treaty and fishing rights. Since no adverse health or environmental effects are anticipated to result from the project, the USACE has determined that no disproportional impacts to minority or low-income populations will occur. Therefore, the proposed project is in compliance with this EO.

9. COORDINATION

The following agencies and entities have been involved with the environmental coordination of the proposed project:

- City of Seattle (Parks Department)
- Washington Department of Fish and Wildlife
- Muckleshoot Tribe
- Washington State Department of Ecology
- USFWS
- NOAA Fisheries

Coordination with the above listed agencies and tribes ranged from phone conversations, e-mail, to site visits and face to face meetings. Topics discussed during this coordination include project design, project construction timing, effects to listed species, and other environmental concerns.

10. CONCLUSION

Based on this assessment and on coordination with federal and state agencies, the proposed project is not expected to result in significant adverse environmental impacts. The proposed project is not considered a major federal action having a significant impact on the human environment. Therefore, the preparation of an environmental impact statement is not required.

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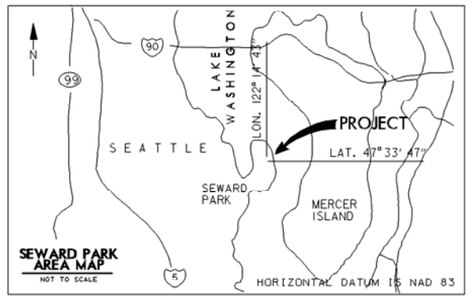
APPENDIX A.

PROJECT DRAWING



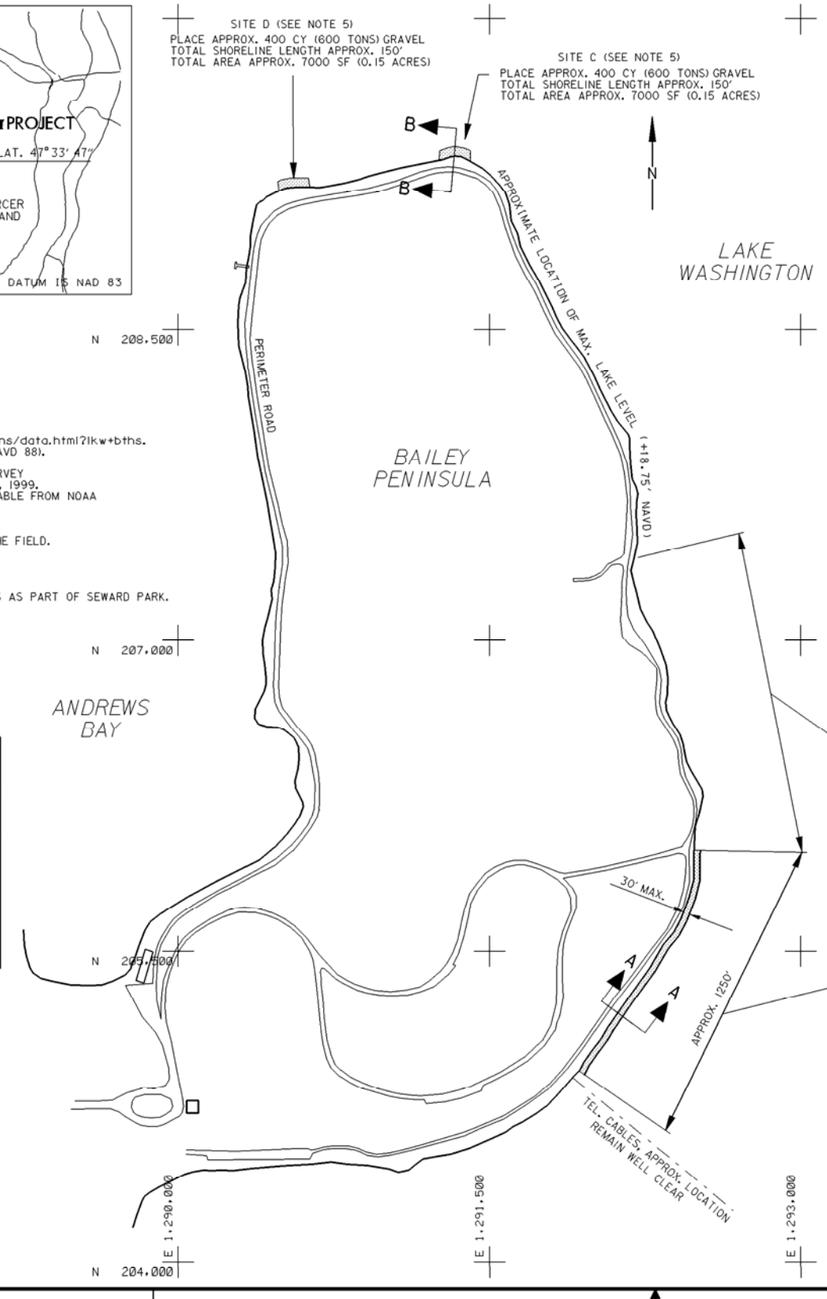
SEWARD PARK AREA MAP
NOT TO SCALE

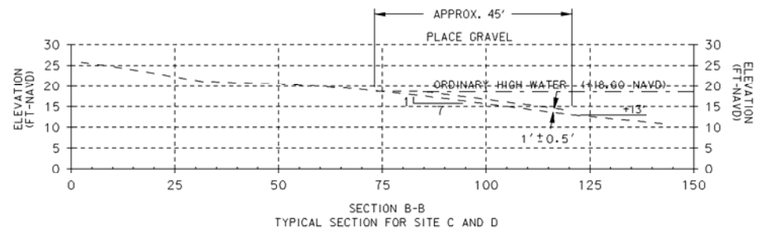
NOTES:

1. HORIZONTAL CONTROL IS BASED ON WA. COORDINATE SYSTEM, NORTH ZONE, NAD 83/91.
2. VERTICAL CONTROL IS BASED ON NAVD 88.
3. LAKE WATER ELEVATION VARIES. SEE: www.nwd-wc.usace.army.mil/nws/hh/basins/data.html?lkw+bths. (SUBTRACT 3.25' TO CONVERT LAKE DATUM TO NAVD 88).
4. ELEVATIONS SHOWN IN SEC A-A ARE FROM A SURVEY CONDUCTED BY THE CORPS OF ENGINEERS IN OCT, 1999. ADDITIONAL BATHYMETRIC INFORMATION IS AVAILABLE FROM NOAA CHART #18447.
5. PLACEMENT LIMITS ARE APPROXIMATE. EXACT PLACEMENT LIMITS WILL BE STAKED IN THE FIELD.
6. PROJECT IS LOCATED WITHIN TOWNSHIP 24, RANGE 4 OF THE WILLAMETTE MERIDIAN.
7. THE CITY OF SEATTLE OWNS ALL PROJECT LANDS AS PART OF SEWARD PARK.

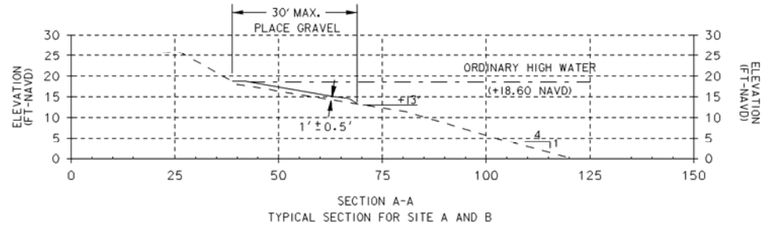
TABLE I.
HABITAT GRADATION

U.S. STANDARD SIEVE SIZE	PERCENT PASSING BY WEIGHT
2½ inches	100
1½ inches	40 - 100
¾ inches	0 - 40
U.S. No. 200	0 - 5





SECTION B-B
TYPICAL SECTION FOR SITE C AND D



SECTION A-A
TYPICAL SECTION FOR SITE A AND B

LEGEND

PLACEMENT AREA

300' 0 200' 400' 600'
REDUCED TO 50% OF FULL SIZE

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

SEWARD PARK SECTION 544 PROJECT

PLAN AND SECTIONS

SEATTLE WASHINGTON

SIZE	INVITATION NO.	FILE NO.	DATE	PLATE
D		C-2-4-316	06 JAN 24	
DSGN. EEN		CHK. NKS	SHEET 1	

REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY

DATE AND TIME PLOTTED: 03-FEB-2006 06:53 DESIGN FILE: J:#nd#lw#coastal#Seward Park#sp05hrc102.dgn

APPENDIX B.

DRAFT FONSI

CENWS-PM-PL-ER

SEWARD PARK BEACH NOURISMENT SECTION 544 PROJECT
KING COUNTY, WASHINGTON

DRAFT FINDING OF NO SIGNIFICANT IMPACT

1. Background. The proposed action is described in detail in the attached environmental assessment (EA). The proposed project is authorized by Section 544 of the Water Resources Development Act of 2000 (Public Law 106–541, Dec. 11, 2000), which supports critical ecosystem restoration projects under the Puget Sound and Adjacent Waters Restoration (PSAWR) program. The PSAWR program supports projects that preserve, protect, and restore critical ecosystem processes, habitats, and functions within the Puget Sound basin.

2. Purpose and Need. The purpose of this project is to restore some of the natural shoreline features that existed in Lake Washington prior to 1916 and to continue enhancing the substrate at Seward Park by placing sand and gravel in order to improve rearing habitat for juvenile Chinook salmon.

3. Proposed Action. The proposed action will place approximately 3500 cubic yards (total) of sand and gravel in a one-foot-thick layer over the existing quarry spall substrate in three nearshore areas adjacent to Seward Park. The materials will be placed from shore out to a distance of approximately 30 feet. Each northern area is approximately 150 feet long and will receive approximately 400 cubic yards of sand and gravel. The southeastern area is approximately 1650 feet long and will receive approximately 2700 cubic yards of sand and gravel. In the northern segment of the southeastern area, the materials will be placed intermittently to cover only those areas where the substrate is currently quarry spalls. The materials will be brought in by barge, offloaded using a conveyor, and distributed using a rotating disk.

4. Summary of Environmental Impacts. Pursuant to the National Environmental Policy Act, an Environmental Assessment (EA) has been prepared for the proposed work. This document describes the environmental consequences of the proposed work, which are briefly summarized below.

Some increased turbidity will likely occur during the substrate placement, but best management practices will be in place to avoid and minimize potential impacts. The proposed action could include a temporary decrease air quality due to emissions from the tug and barge, construction equipment, and vehicles of construction personnel. Also, the proposed action will temporarily increase noise levels in the project areas which may disturb birds, mammals, and park visitors. However, these effects are expected to be short-term and localized, and therefore have no significant impact on the project or action areas

Construction will take place during a time period approved by Washington Department of Fish and Wildlife, NOAA Fisheries, and the U.S. Fish and Wildlife Service which minimizes the

likelihood of adverse construction impacts to Chinook, coho, sockeye, steelhead, and Bald Eagles.

Cumulative impacts of the proposed project have been evaluated and are expected to incrementally enhance ecological functions and values, particularly with regard to salmonid passage and habitat utilization.

5. Finding. Based on the analysis described above and provided in more detail in the EA, this project is not a major federal action significantly affecting the quality of the human environment and, therefore, does not require an environmental impact statement.

_____ _____

Date

Debra M. Lewis
Colonel, Corps of Engineers
District Engineer