LIST OF HABITAT TYPES AND FUNCTIONS

Estuary

Coastal areas where fresh water enters salt water. They contain a variety of habitats and often support a great diversity of species, which interact in a complex network of predator-prey relationships. These areas serve as spawning and nursery grounds for many species of fish and shellfish. They also support many birds because of the rich food supply, intertidal areas, and diverse habitats.

Deep Subtidal

Deeper water areas of bays, from -30 to -60 feet. Microscopic plants (phytoplankton) are the driving force of the food web produced in these areas. Very small crustaceans feed on the phytoplankton and in turn provide food for a variety of fish including rockfish, cod, flatfish, and sculpin. Marine mammals, such as harbor seals, also use these areas. Migratory birds such as grebes, cormorants and scoters forage in these areas. Clams and worms predominate on the bottom.

Vegetated Shallows

Includes both eelgrass and macroalgae bed habitats as follows:

Eelgrass - Eelgrass beds can occur from low-water level to -30 feet in areas of estuaries sheltered from direct wave action. Eelgrass has several important ecological functions. Eelgrass meadows support a community of microalgae and small seaweeds, and are critical rearing and feeding areas for young fish and crab. Eelgrass releases large quantities of nutrients back into the ecosystem. It is also consumed by waterfowl such as black brant, geese, and ducks.

Macroalgae beds - Macroalgae beds include beds of kelp and other large algae on rock outcroppings and gravel bottoms. These occur mainly in the subtidal zone but also extend into the intertidal zone. Starfish, crabs, shrimp, limpets, mussels, and rockfish commonly use these areas. Also found in these areas are tidepools with diverse plant and animal life.

Mudflats

Intertidal shores without large plants and with loose sediment particles like silt and clay. Microscopic plants encourage production of clams and polychaete worms. Shorebirds feed on these organisms at low tide. Various fish species use the area when the tide is in and, in turn, become food for western grebes, scoters, cormorants, and great blue herons.

Gravel/cobble/sand

Intertidal shores with few large plants and with loose coarse-grained sediments and somewhat mobile gravel and cobble beaches. Bait fish use the areas for spawning and important forage fish inhabit these habitats. Shorebirds, diving birds and other waterfowl feed actively on the benthic and epibenthic plants and animals and debris

found here.

Emergent Marshes

Includes low and high saltmarshes and freshwater marshes as follows:

Low & High Saltmarshes - Low and high saltmarshes are intertidal shores where erect, rooted, leafy, and green plants grow. Typical plants include salt grass, tufted hairgrass, bulrush, spike rush, arrowgrass, pickleweed and sedge. This habitat is transitional between lowlands and mudflats. Marshes release large quantities of nutrients to other estuarine habitats during spring tides. Marshes support a food web dominated by insects and provides food and shelter for waterfowl and small mammals.

Brackish Marshes - Freshwater marshes located next to saltmarshes, but with a freshwater influence, providing a mix of salt-tolerant and inland plants. Small mammals and birds of prey are common. Open-water pools and sloughs provide feeding and refuge areas for fish and waterfowl, and adjustment areas for salmon and trout on their way to the salt water. A variety of mammals, birds, reptiles, and amphibians use these areas.

Riverine

The systems of riverbeds and streambeds within channels of the study areas. They are bounded on the landward side by riparian uplands, by the channel banks, including natural and constructed levees, or by wetlands dominated by trees, shrubs, persistent emergents, or mosses. Resident and migratory fishes and some waterfowl use these waterways for passage, foraging, and reproduction and aquatic plants and invertebrates populate their beds

Riparian Systems

Riparian systems occur along rivers and streams with typical vegetation including willow, cottonwood, red alder, and salmonberry. Healthy riparian areas have many animals and plants and high productivity. Trees and shrubs provide nesting, roosting, feeding, and cover. Large trees can become snags providing important habitat, and can provide a supply of large woody debris important to streams and the estuary. Riparian foliage shades the stream providing temperature control, stabilizes the stream bank with roots, and filters out nutrient runoff from uplands. Denser riparian corridors and associated wetlands provide protective pathways for large and small mammals, reptiles, waterfowl, and song birds, and are important breeding, feeding, and migration areas for fish.

Corridors

Corridors are habitat areas that provide a pathway for wildlife movement. Healthy riparian systems provide corridors between the estuary and the Basin. Corridors between remaining and restored

fragments of habitat are also important. Corridors can be created by establishing stratified upland buffers (vegetated areas that surround a wetland and reduce adverse impacts from adjacent development). Aquatic environments can also have corridors, linking areas of mudflat, marsh, vegetated shallows, and adjacent uplands.

POTENTIAL RESTORATION HABITAT TYPES

ECOLOGICAL FUNCTION	USED BY	ORGANISMS
Deep Subtidal -60 ft. to -30 ft (NOAA zero sea level datum)		
life cycle	fishes food web	rockfish, cod, flatfish, sculpin, crabs octopus, squid
resting, feeding	birds mammals	cormorants, auklets, grebes, scoters whales, seals, porpoises
Vegetated Shallows -30 ft to +15 ft		
feeding	fishes food web	juvenile fishes, herring, crabs, flounders, sculpin plants, algae, benthos, epibenthos
protection, cover, feeding, nesting, corridors	plants birds mammals	macroalgae, eelgrass, kelp waterfowl, herons, raptors seals, sea lions
Mudflats -14 ft. to +15 ft		
feeding	fishes food web	salmonids, crabs, flatfish, invertebrates algae, plants, benthos, epibenthos
protection, cover, feeding, nesting, corridors	plants birds mammals	macroalgae, eelgrass, kelp waterfowl, waders, diving birds harbor seal, raccoon, opossum, people
Gravel/Cobble/Sand -14 ft. to +15 ft		
feeding	fishes food web	surf smelt, sand lance, forage fishes, invertebrates algae, benthos, epibenthos
protection, cover, feeding, nesting, corridors	plants birds mammals	macroalgae waterfowl, diving birds, shorebirds raccoon, people

ECOLOGICAL FUNCTION	USED BY	ORGANISMS
Emergent Marsh		
Marine: 0 ft to +15 ft. feeding	fishes food web	juvenile fish, trout algae, plants, benthos, epibenthos
protection, cover, feeding, nesting, corridors	plants birds mammals	macroalgae, eelgrass, kelp waterfowl, waders harbor seal, raccoon, opossum, people
Brackish: 0 ft to +15 ft. feeding	fishes food web	juvenile fish, trout insects, plants
protection, cover, feeding, nesting, corridors	plants birds mammals	wetland plants waterfowl, waders raccoon, opossum, otters, people
Freshwater: 0 ft to +15 ft. feeding	fishes food web	juvenile fish, trout plants, insects
protection, cover, feeding, nesting, corridors	plants birds mammals	wetland plants waterfowl, waders, songbirds, raptors otters, raccoon, beaver, opossum, mice, people
Riverine 0 ft to +15 ft		
feeding	fishes food web	juvenile fish, trout plants, insects, invertebrates
protection, cover, feeding, nesting, corridors	plants birds	wetland and aquatic plants waterfowl, waders, songbirds, raptors
Riparian +15 ft.		
connections to river and to bay: perching, nesting, resting, cover, migration, food, water quality	birds mammals	raptors, herons, ducks, songbirds, birds, otters, raccoon, coyote, mink, beaver, bats, people

These materials are excerpted from: Commencement Bay Natural Resource Trustees. 1997. Commencement Bay Natural Resource Damage Assessment Restoration Plan and Final Programmatic Environmental Impact Statement. [Available from NOAA DARC/NW, 7600 Sand Point Way NE, Seattle, WA 98115 or by downloading the Restoration Plan at www.darcnw.noaa.gov.]