

APPENDIX B

Assessment of Documented and Expected Species

Assessment of Documented and Expected Species

Table B-1 summarizes the documented species along the nearshore areas of Maury Island. Species habitat use is shown by zone. This summary is based on the review of nearshore data sources and literature and beach seine data provided by King County (Brennan unpublished). Species for which no habitat association data were found are listed by zone and labeled as undefined.

Assessment of Expected Species

The following species food web description provides an example of the ecological processes that control the species assemblages. Analysis of Maury Island nearshore ecological processes and the species assemblages likely to occur as a result of these processes was used to derive the expected (assumed) species.

Calanoid copepods and gammarid amphipods are recognized as being critical to upper trophic levels in the shallow subtidal zones because they serve as food resources for important fish species or they convert organic matter to make it available to higher level consumers (e.g., detritus processors). Calanoid copepods and gammarid amphipods are the primary prey of important secondary consumers such as Pacific herring, Pacific sand lance, and juvenile Pacific salmon, which are used by higher level carnivores (Williams et al. 2001; Simenstad et al. 1979).

In general, the principal secondary consumers in shallow neritic habitats (i.e., surface waters and water column of the nearshore region) of Puget Sound are schooling fishes such as juvenile and adult Pacific herring, Pacific sand lance, northern anchovy, longfin smelt, and surf smelt (Simenstad et al. 1979). Almost all marine birds and mammals found in neritic habitats are tertiary consumers that feed on these forage fish species. In gravel-cobble shallow subtidal habitats, important secondary carnivores are primarily juvenile and adult flatfish, including English sole and rock sole. In associated kelp habitats are typically demersal or bottom-oriented fishes, including greenlings, gunnels, sculpins, rockfishes, and gobies, and gastropods, octopus, and a variety of seastars. In turn, harbor seals, northern sea lions, and orcas prey upon larger demersal fishes (Simenstad et al. 1979).

Benthic-feeding shorebirds, such as greater yellowlegs, sanderling, great blue heron, and sandpipers, are prevalent in this habitat, as well as protected sand/eelgrass and mud/eelgrass habitats. Mud/eelgrass habitats, commonly associated with saltmarsh environments, are considered the most complex and highly connected food webs. Besides many of the fish species already mentioned, juvenile salmon (especially chum), staghorn sculpin (*Leptocottus armatus*), crescent gunnel (*Pholis laeta*), pipefish (*Syngnathus* spp.), various flatfish species, and shiner perch (*Cymatogaster aggregata*) are the predominant secondary consumers in these protected shallow water habitats (Simenstad et al. 1979).

Table B-1. Documented species – habitat use.

Species			Nearshore Habitat Use Per Zone							
			Marine Riparian Zone	Supratidal Zone	Eulittoral Zone			Shallow Subtidal		
Group	Scientific Name	Common Name	Riparian	Salt Marsh	Sand-Small Gravel	Intertidal Gravel-Cobble	Intertidal (undefined)	Mud and Sand Eelgrass	Subtidal (undefined)	Kelp
Birds	<i>Haliaeetus leucocephalus</i>	Bald eagle	X							
	<i>Phalacrocorax penicillatus</i>	Black brandt						X		X
	<i>Ardea herodias</i>	Great blue heron				X				
Fish	<i>Clupea harengus pallasii</i>	Herring						X		X
	<i>Hypomesus pretiosus</i>	Surf smelt			X					
	<i>Ammodytes hexapterus</i>	Pacific sand lance			X					
	<i>Oncorhynchus spp</i>	Salmon						X		X
	<i>Oncorhynchus nerka</i>	Sockeye salmon							X	
	<i>Oncorhynchus gorbuscha</i>	Pink salmon							X	
	<i>Oncorhynchus keta</i>	Chum salmon				X		X		X
	<i>Oncorhynchus tshawytscha</i>	Chinook salmon				X		X		X
	<i>Oncorhynchus kisutch</i>	Coho salmon							X	
	<i>Oncorhynchus mykiss</i>	Steelhead							X	
	<i>Oncorhynchus clarki.</i>	Cutthroat trout							X	
	<i>Salmo salar</i>	Atlantic salmon							X	
	<i>Salvelinus spp</i>	Char							X	
	<i>Sebastes spp.</i>	Rockfish							X	
	<i>Rhacochilus vacca</i>	Pile perch							X	
<i>Embiotoca lateralis</i>	Striped sea perch							X		
<i>Cymatogaster aggregata</i>	Shiner perch							X		
<i>Ophiodon elongatus</i>	Lingcod							X		
<i>Gadus macrocephalus</i>	Pacific cod							X		

Species			Nearshore Habitat Use Per Zone							
			Marine Riparian Zone	Supratidal Zone	Eulittoral Zone			Shallow Subtidal		
Group	Scientific Name	Common Name	Riparian	Salt Marsh	Sand-Small Gravel	Intertidal Gravel-Cobble	Intertidal (undefined)	Mud and Sand Eelgrass	Subtidal (undefined)	Kelp
	<i>Porichthys spp</i>	Pacific midshipman							X	
	<i>Microgadus proximus</i>	Pacific tomcod							X	
	<i>Hexagrammos stelleri</i>	White-spot greenling							X	
	<i>Theragra chalcogramma</i>	Walleye Pollock							X	
	<i>Oxylebius pictus</i>	Painted greenling							X	
	<i>Hexagrammos decagrammus</i>	Kelp greenling							X	
	<i>Enophrys bison</i>	Buffalo sculpin							X	
	<i>Scorpaenichthys marmoratus</i>	Cabazon							X	
	<i>Pleuronichthys coenosus</i>	C-O sole					X		X	
	<i>Pleuronectes vetulus</i>	English sole					X		X	
	<i>Hippoglossoides elassodon</i>	Flathead sole					X		X	
	<i>Lepidopsetta bilineata</i>	Rock sole					X		X	
	<i>Psettichthys melanostictus</i>	Sand sole					X		X	
	<i>Platichthys stellatus</i>	Starry flounder					X		X	
	<i>Citharichthys stigmaeus</i>	Speckled sanddab					X		X	
	<i>Citharichthys spp</i>	Sanddabs					X		X	
	<i>Citharichthys sordidus</i>	Pacific sanddab					X		X	
	<i>Pleuronectes isolepis</i>	Butter sole					X		X	
	<i>Aulorhynchus flavidus</i>	Tube snout							X	
	<i>Syngnathus griseolineatus</i>	Bay pipefish							X	
	<i>Agonopsis vulsa</i>	Northern spearnose					X			
	<i>Pholis laeta</i>	Crescent gunnel					X			
	<i>Pholis ornata</i>	Saddleback gunnel					X			
	<i>Apodichthys flavidus</i>	Penpoint gunnel					X			

Species			Nearshore Habitat Use Per Zone							
			Marine Riparian Zone	Supratidal Zone	Eulittoral Zone			Shallow Subtidal		
Group	Scientific Name	Common Name	Riparian	Salt Marsh	Sand-Small Gravel	Intertidal Gravel-Cobble	Intertidal (undefined)	Mud and Sand Eelgrass	Subtidal (undefined)	Kelp
	<i>Clevelandia ios</i>	Arrow goby					X			
	<i>Lepidogobius lepidus</i>	Bay goby					X			
	<i>Lumpenus sagitta</i>	Snake prickleback					X			
	<i>Myoxocephalus polyacanthocephalus</i>	Great sculpin					X			
	<i>Icelinus borealis</i>	Northern sculpin					X			
	<i>Artedius fenestralis</i>	Padded sculpin					X			
	<i>Oligocottus maculosus</i>	Tidepool sculpin					X			
	<i>Blepsias cirrhosus</i>	Silverspotted sculpin					X			
	<i>Gymnoanthus tricuspis</i>	Staghorn sculpin					X			
	<i>Nautichthys oculo-fasciatus</i>	Sailfin sculpin					X			
	?	Spiney Lumpsucker					X			
	<i>Podothecus acipenserinus</i>	Sturgen poacher					X			
	<i>Gasterostreus aculeatus</i>	Threespine stickleback					X			
	<i>Squalus acanthias</i>	Dogfish							X	
	<i>Hydrolagus colliei</i>	Ratfish							X	
	<i>Hemilepidotus hemilepidotus</i>	Red Iris lord								
	<i>Raja binoculata</i>	Big skate					X			
Invertebrate	<i>Panopea abrupta</i>	Geoduck						X		
	<i>Clinocardium nuttali</i>	Horse clam							X	
	<i>Clinocardium nuttallii</i>	Cockle							X	
	<i>Tectura scutum</i>	Limpet					X			
	<i>Cryptochiton stelleri</i>	Chiton					X			

Species			Nearshore Habitat Use Per Zone							
			Marine Riparian Zone	Supratidal Zone	Eulittoral Zone			Shallow Subtidal		
Group	Scientific Name	Common Name	Riparian	Salt Marsh	Sand-Small Gravel	Intertidal Gravel-Cobble	Intertidal (undefined)	Mud and Sand Eelgrass	Subtidal (undefined)	Kelp
	<i>Mytilus spp</i>	Mussel					X			
	<i>Pododesmus spp</i>	Jingle shell					X			
	<i>Pagurus armatus</i>	Hermit crab				X				
	<i>Pugettia producta</i>	Kelp Crab					X			
	<i>Balanus spp</i>	Barnacles				X				
	<i>Pycnopodia helianthoids</i>	Start fish							X	
	<i>Parasticopus spp.?</i>	Cucumber				X		X		X
	<i>Stronglyocentrotus droebachiensis</i>	Green sea urchin				X	X			
		Sea anemone					X			
		Nudibranch					X			
Terrestrial Plants	<i>Carex lyngbyei</i>	Sedge		X						
Aquatic Plants	<i>Phyllospadix scouleri</i>	Surfgrass						X		
Algae	<i>Ulva spp</i>	Sea lettuce				X				
	<i>Sargassum spp</i>					X		X		

Sources: Lemberg et al. 1997; Jones & Stokes and AR 1999; AES 2000; WDNR 2001; EVS 2000; Anchord 2004.

The following tables list and summarize the main species that are assumed to be present or utilize the study area, based on habitat availability as a function of the ecological processes controlling the species assemblages.

Table B-2. Assumed migratory salmonid fish species—Maury Island habitat use.

Migratory Fish			Status and Timing of Potential Occurrence in the Nearshore Area	
Family	Scientific Name	Common Name	Federal Status Within the Study Area	Timing
Salmonidae	<i>Oncorhynchus keta</i>	chum		February-June
	<i>Oncorhynchus gorbuscha</i>	pink		February-June (even years)
	<i>Oncorhynchus tshawytscha</i>	chinook	Threatened Species	February-mid-December
	<i>Oncorhynchus kisutch</i>	coho	Candidate Species	March-October
	<i>Oncorhynchus nerka</i>	sockeye		Early June
	<i>Oncorhynchus clarki clarki</i>	coastal cutthroat		Year round (as smolts, sub-adults, and adults)
	<i>Oncorhynchus mykiss</i>	steelhead		March-June with outmigration March-May
	<i>Salvelinus confluentus</i>	bull trout	Threatened Species	Year round (as smolts, sub-adults, and adults). December-February freshwater overwintering.

Table B-3. Assumed resident fishes—Maury Island habitat use.

Intertidal Resident Fish			Nearshore Habitat Use		
Family	Scientific Name	Common Name	Intertidal Gravel-Cobble	Subtidal Mud and Sand Eelgrass	Subtidal Kelp
Pholidae	<i>Lumpenus sagitta</i>	snake prickleback	X	X	
	<i>Apodichthys flavidus</i>	penpoint gunnel		X	X
	<i>Pholis laeta</i>	crescent gunnel		X	X
Hexagrammidae	<i>Hexagrammos decagrammus</i>	kelp greenling			X
Syngnathidae	<i>Syngnathus leptorhynchus</i>	bay pipefish		X	
Cottidae	<i>Jordania zonope</i>	longfin sculpin			X
	<i>Artedius fenestralis</i>	padded sculpin	X	X	
	<i>Clinocottus acuticeps</i>	sharpnose sculpin		X	
	<i>Blepsias cirrhosus</i>	silverspotted sculpin	X	X	
	<i>Enophrys bison</i>	buffalo sculpin	X	X	
	<i>Leptocottus armatus</i>	Pac. staghorn sculpin	X		
	<i>Clinocottus embryum</i>	calico sculpin		X	
	<i>Oligocottus maculosus</i>	tidepool sculpin	X		
	<i>Artedius harringtoni</i>	scalyhead sculpin			X
Embiotocidea	<i>Cymatogaster aggregata</i>	shiner perch	X	X	
	<i>Rhacochilus vacca</i>	pile perch		X	
Gasterosteidae	<i>Aurlorhynchus flavidus</i>	tube-snout		X	
Bothidae	<i>Citharichthys stigmaeus</i>	speckled sanddab		X	

Adapted from Dethier 1990; Garrison & Miller 1982; Simenstad et al. 1979.

Table B-4. Assumed resident fishes—Maury Island water column use.

Family	Intertidal Resident Fish		Nearshore Habitat Use			
	Scientific name	Common name	Spawning Habitat	Eggs	Larvae	Adult Habitat
Pholidae	<i>Apodichthys flavidus</i>	penpoint gunnel	demersal	demersal	pelagic	demersal
	<i>Pholis leata</i>	crescent gunnel	demersal	demersal	pelagic	demersal
Hexagrammidae	<i>Hexagrammos decagrammus</i>	kelp greenling	demersal: rocky	demersal	pelagic	demersal
Syngnathidae	<i>Syngnathus leptorhynchus</i>	bay pipefish	Unknown	Unknown	Unknown	inshore protected areas
Cottidae	<i>Jordania zonope</i>	longfin sculpin	Unknown	demersal	Unknown	demersal
	<i>Artedius fenestralis</i>	padded sculpin	demersal: rocks	demersal	pelagic	demersal
	<i>Clinocottus acuticeps</i>	sharpnose sculpin	demersal	demersal	pelagic	demersal
	<i>Blepsias cirrhosus</i>	silverspotted sculpin	demersal	demersal	pelagic	demersal
	<i>Enophrys bison</i>	buffalo sculpin				
	<i>Leptocottus armatus</i>	Pac. Staghorn sculpin	Unknown	Demersal	pelagic	demersal
	<i>Clinocottus embryum</i>	calico sculpin	Unknown	Unknown	Unknown	demersal
	<i>Oligocottus maculosus</i>	tidepool sculpin	demersal	Demersal	pelagic	demersal
	<i>Artedius harringtoni</i>	scalyhead sculpin	Unknown	Unknown	pelagic	demersal
	Embiotocidea	<i>Cymatogaster aggregata</i>	shiner perch	pelagic nearshore		
<i>Rhacochilus vacca</i>		pile perch	pelagic nearshore			pelagic nearshore
Gasterosteidae	<i>Aurlorhynchus flavidus</i>	tube-snout	demersal	Demersal	pelagic	pelagic
Bothidae	<i>Citharichthys stigmaeus</i>	speckled sanddab	Unknown	Unknown	pelagic	demersal

Adapted from Dethier 1990; Garrison & Miller 1982; Simenstad et al. 1979.

Table B-5. Assumed seasonal resident fishes – Maury Island habitat use.

Seasonal Resident Fish			Nearshore Habitat Use				
Family	Scientific Name	Common Name	Spawn	Juvenile Rearing	Adult Res.	Habitat Type	Timing
Gadidae	<i>Gadus macrocephalus</i>	Pacific cod		X		Intertidal gravel-cobble Subtidal eelgrass	Summer-fall
	<i>Theragra Chalcogramma</i>	Walleye pollock		X		Intertidal gravel-cobble Subtidal eelgrass	Juvenile: spring-winter
Hexagrammidae	<i>Ophiodon elongates</i>	lingcod		X		Juvenile Intertidal gravel Subtidal eelgrass Adult subtidal kelp	Juvenile: summer Adult: year round
Pleuronectidae	<i>Pleuronectes vetulus</i>	English sole	X	X	X	Intertidal gravel-cobble Subtidal eelgrass	Year round - Juvenile recruitment Jan- Feb and April-May on coast and Dec- March and May to July in Puget Sound

X indicates extensive use.

Adapted from: Garrison & Miller 1982; Miller et al. 1976 and 1978; Shi 1987; Simenstad et al. 1979.

Table B-6. Summary of nearshore marine habitat use by important groundfish species and federal status of stocks assumed in Maury Island.

Common Name	Scientific Name	Federal Stock Status	Nearshore Marine Use ^a		
			Adult Spawning	Residence & Migration	Juvenile Rearing
Pacific Cod	<i>Gadus macrocephalus</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm		●	●
Walleye Pollock	<i>Theragra chalcogramma</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm		●	●
Pacific Hake	<i>Merluccius productus</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm		●	●
Lingcod	<i>Ophiodon elongatus</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm	●	●	●
English Sole	<i>Pleuronectes vetulus</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm		●	●
Rock Sole	<i>Lepidopsetta bilineata</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm	●	●	●
Black Rockfish	<i>Sebastes melanops</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm	●	●	●
Brown Rockfish	<i>Sebastes auriculatus</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm	●	●	●
Copper Rockfish	<i>Sebastes caurinus</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm	●	●	●
Quillback Rockfish	<i>Sebastes maliger</i>	http://www.nwr.noaa.gov/1salmon/salmesa/fedreg.htm	●	●	●

Adapted from William and Thom 2001.

^a Filled circles represent extensive use of these areas.

Table B-7. Assumed habitat-specific table of species in Maury Island.

No.	Group	Species	Salt Marsh	Intertidal Gravel Cobble	Eelgrass	Subtidal (soft Bottom)	Water Column
1	Birds	American coot					
2	Birds	American goldfinch					
3	Birds	American wigeon					
4	Birds	black brant					
5	Birds	black turnstone					
6	Birds	bufflehead					
7	Birds	Canada goose					
8	Birds	cassins auklet					
9	Birds	common goldeneye					
10	Birds	common merganser					
11	Birds	common murre					
12	Birds	common snipe					
13	Birds	Dark-eyed junco					
14	Birds	double-crested cormorant					
15	Birds	dunlin					
16	Birds	gadwall					
17	Birds	glaucous-winged gull					
18	Birds	great blue heron					
19	Birds	greater yellowlegs					
20	Birds	green-winged teal					
21	Birds	horned grebe					
22	Birds	killdeer					
23	Birds	least sandpiper					
24	Birds	mallard					
25	Birds	merlin					
26	Birds	Mew gull					
27	Birds	northern oriole					
28	Birds	osprey					
29	Birds	red-breasted merganser					
30	Birds	red-tailed hawk					
31	Birds	redwing blackbird					
32	Birds	savannah sparrow					
33	Birds	short-billed dowitcher					
34	Birds	short-eared owl					
35	Birds	song sparrow					
36	Birds	spotted sandpiper					
37	Birds	Virginia rail					

No.	Group	Species	Salt Marsh	Intertidal Gravel Cobble	Eelgrass	Subtidal (soft Bottom)	Water Column
38	Birds	western grebe					
39	Birds	western sandpiper					
40	Fish	bay goby					
41	Fish	bay pipefish					
42	Fish	black rockfish					
43	Fish	brown rockfish					
44	Fish	buffalo sculpin					
45	Fish	cabezon					
46	Fish	chinook salmon					
47	Fish	chum salmon					
48	Fish	coho salmon					
49	Fish	copper rockfish					
50	Fish	C-O sole					
51	Fish	crescent gunnel					
52	Fish	cutthroat trout					
53	Fish	Dolly varden					
54	Fish	Dover sole					
55	Fish	English sole					
56	Fish	great sculpin					
57	Fish	green sturgeon					
58	Fish	hybrid sole					
59	Fish	Kelp greenling					
60	Fish	Kelp perch					
61	Fish	largescale sucker					
62	Fish	lingcod					
63	Fish	mountain whitefish					
64	Fish	northern anchovie					
65	Fish	northern squawfish					
66	Fish	Pacific cod					
67	Fish	Pacific hake					
68	Fish	Pacific herring					
69	Fish	Pacific sandlance					
70	Fish	Pacific sanddab					
71	Fish	Pacific staghorn sculpin					
72	Fish	Pacific tomcod					
73	Fish	padded sculpin					
74	Fish	penpoint gunnel					
75	Fish	pile perch					
76	Fish	Pink samon					

No.	Group	Species	Salt Marsh	Intertidal Gravel Cobble	Eelgrass	Subtidal (soft Bottom)	Water Column
77	Fish	quillback rockfish					
78	Fish	ratfish					
79	Fish	River lamprey					
80	Fish	Rock sole					
81	Fish	rough sculpin					
82	Fish	sand sole					
83	Fish	shiner perch					
84	Fish	snake prickleback					
85	Fish	soft sculpin					
86	Fish	speckled sanddab					
87	Fish	starry flounder					
88	Fish	steelhead trout					
89	Fish	striped seaperch					
90	Fish	sturgeon poacher					
91	Fish	surf smelt					
92	Fish	threespine stickleback					
93	Fish	Tube-snout					
94	Fish	walleye pollock					
95	Fish	western brook lamprey					
96	Fish	whitespotted greenling					
97	Invertebrate	Dungeness crab					
98	Invertebrate	red rock crab					
99	Mammal	Gray whale					
100	Mammal	muskrat					
101	Mammal	northern sea lion					
102	Mammal	Pacific harbor seal					
103	Mammal	raccoon					
104	Mammal	River otter					
105	Mammal	Townsend vole					

Adapted from Simenstad et al. 1991 and Simenstad et al. 1979.

Table B-8. Species that are known or expected to have a dependence, or association with marine riparian areas (i.e., utilization for feeding, breeding, refuge, migration, prey/nutrient production, etc), and therefore, could potentially occur in Maury Island.

Checklist is based upon documented occurrence and/or professional opinion of reviewers. Additional research is needed to verify ecological linkages and utilization of Maury Island’s marine riparian areas by wildlife. Table adapted from Brennan and Culverwell (In Press).

AMPHIBIANS	MAMMALS	MAMMALS (cont'd)	MAMMALS (cont'd)
<input checked="" type="checkbox"/> Northwestern Salamander	<input checked="" type="checkbox"/> Virginia Opossum (I)	<input checked="" type="checkbox"/> Raccoon	<input checked="" type="checkbox"/> Beaver
<input checked="" type="checkbox"/> Long-Toed Salamander	<input checked="" type="checkbox"/> Cinerous Shrew	<input checked="" type="checkbox"/> Marten	<input checked="" type="checkbox"/> Deer Mouse
	<input checked="" type="checkbox"/> Trowbridge Shrew		<input checked="" type="checkbox"/> Northwestern Deer Mouse
	<input checked="" type="checkbox"/> Vagrant Shrew		<input checked="" type="checkbox"/> Bushytailed Woodrat
<input checked="" type="checkbox"/> Ensatina	<input checked="" type="checkbox"/> Montane Shrew	<input checked="" type="checkbox"/> Long-tailed Weasel	<input checked="" type="checkbox"/> Black Rat(I)
<input checked="" type="checkbox"/> Western Red-Backed Salamander	<input checked="" type="checkbox"/> Water Shrew	<input checked="" type="checkbox"/> Mink	<input checked="" type="checkbox"/> Norway Rat (I)
<input checked="" type="checkbox"/> Rough-skinned Newt	<input checked="" type="checkbox"/> Marsh Shrew		<input checked="" type="checkbox"/> House Mouse(1)
<input checked="" type="checkbox"/> Tailed Frog	<input checked="" type="checkbox"/> Townsend's Mole	<input checked="" type="checkbox"/> River Otter	<input checked="" type="checkbox"/> Southern Red-backed Vole
<input checked="" type="checkbox"/> Western Toad	<input checked="" type="checkbox"/> Coast Mole		
<input checked="" type="checkbox"/> Pacific Treefrog	<input checked="" type="checkbox"/> Shrew Mole	<input checked="" type="checkbox"/> Striped Skunk	
<input checked="" type="checkbox"/> Red-legged Frog	<input checked="" type="checkbox"/> Little Brown Bat	<input checked="" type="checkbox"/> Mountain Lion (Cougar)	
	<input checked="" type="checkbox"/> Keen's Myotis	<input checked="" type="checkbox"/> Bobcat	<input checked="" type="checkbox"/> Water Vole
	<input checked="" type="checkbox"/> Yuma Myotis	<input checked="" type="checkbox"/> Elk	<input checked="" type="checkbox"/> Muskrat
	<input checked="" type="checkbox"/> Long-eared Myotis	<input checked="" type="checkbox"/> White-Tailed Deer	<input checked="" type="checkbox"/> Pacific Jumping Mouse
	<input checked="" type="checkbox"/> Long-legged Myotis	<input checked="" type="checkbox"/> Mule Deer	
	<input checked="" type="checkbox"/> California Myotis		
	<input checked="" type="checkbox"/> Silver-haired Bat	<input checked="" type="checkbox"/> Mountain Beaver	<input checked="" type="checkbox"/> Nutria (Coypu) (I)
	<input checked="" type="checkbox"/> Big Brown Bat	<input checked="" type="checkbox"/> Townsend's Chipmunk	
	<input checked="" type="checkbox"/> Hoary Bat		<input checked="" type="checkbox"/> Eastern Cottontail (I)
	<input checked="" type="checkbox"/> Coyote		
TOTAL AMPHIBIANS: 9			

REPTILES
<input checked="" type="checkbox"/> Northern Alligator Lizard
<input checked="" type="checkbox"/> Western Fence Lizard
<input checked="" type="checkbox"/> Common Garter Snake
<input checked="" type="checkbox"/> Western Garter Snake
<input checked="" type="checkbox"/> Northwestern Garter Snake
TOTAL REPTILES: 5

<input checked="" type="checkbox"/> Red Fox	<input checked="" type="checkbox"/> Eastern Gray Squirrel (I)	
<input checked="" type="checkbox"/> Black Bear	<input checked="" type="checkbox"/> Douglas' Squirrel	
	<input checked="" type="checkbox"/> Northern Flying Squirrel	
		TOTAL MAMMALS: 51

BIRDS	BIRDS (cont'd)	BIRDS (cont'd)	BIRDS (cont'd)	BIRDS (cont'd)
<input checked="" type="checkbox"/> Red-throated Loon	<input checked="" type="checkbox"/> Red-breasted Merganser	<input checked="" type="checkbox"/> Parasitic Jaeger	<input checked="" type="checkbox"/> Hammond's Flycatcher	<input checked="" type="checkbox"/> Cedar Waxwing
<input checked="" type="checkbox"/> Pacific Loon	<input checked="" type="checkbox"/> Ruddy Duck	<input checked="" type="checkbox"/> Franklin's Gull	<input checked="" type="checkbox"/> Dusky Flycatcher	<input checked="" type="checkbox"/> European Starling (I)
<input checked="" type="checkbox"/> Common Loon	<input checked="" type="checkbox"/> Osprey	<input checked="" type="checkbox"/> Bonaparte's Gull	<input checked="" type="checkbox"/> Pacific-slope Flycatcher	<input checked="" type="checkbox"/> Orange-crowned Warbler
<input checked="" type="checkbox"/> Pied Billed Grebe	<input checked="" type="checkbox"/> Bald Eagle	<input checked="" type="checkbox"/> Heermann's Gull	<input type="checkbox"/> Say's Phoebe	<input type="checkbox"/> Nashville Warbler
<input checked="" type="checkbox"/> Horned Grebe	<input checked="" type="checkbox"/> Northern Harrier	<input checked="" type="checkbox"/> Mew Gull	<input type="checkbox"/> Western Kingbird	<input type="checkbox"/> Yellow Warbler
<input checked="" type="checkbox"/> Red-necked Grebe	<input checked="" type="checkbox"/> Sharp-shinned Hawk	<input checked="" type="checkbox"/> Ring-billed Gull	<input type="checkbox"/> Eastern Kingbird	<input checked="" type="checkbox"/> Yellow-rumped Warbler
<input checked="" type="checkbox"/> Eared Grebe	<input checked="" type="checkbox"/> Cooper's Hawk	<input checked="" type="checkbox"/> California Gull	<input checked="" type="checkbox"/> Northern Shrike	<input checked="" type="checkbox"/> Black-throated Gray Warbler
<input checked="" type="checkbox"/> Clark's Grebe	<input type="checkbox"/> Northern Goshawk	<input checked="" type="checkbox"/> Herring Gull	<input checked="" type="checkbox"/> Cassin's Vireo (Solitary)	<input checked="" type="checkbox"/> Townsend's Warbler
<input checked="" type="checkbox"/> Western Grebe	<input checked="" type="checkbox"/> Red-tailed Hawk	<input checked="" type="checkbox"/> Thayer's Gull	<input checked="" type="checkbox"/> Hutton's Vireo	<input type="checkbox"/> Hermit Warbler
<input checked="" type="checkbox"/> Double-crested Cormorant	<input type="checkbox"/> Rough-legged Hawk	<input checked="" type="checkbox"/> Western Gull	<input checked="" type="checkbox"/> Warbling Vireo	<input checked="" type="checkbox"/> MacGillivray's Warbler
<input checked="" type="checkbox"/> Brandt's Cormorant	<input type="checkbox"/> Golden Eagle	<input checked="" type="checkbox"/> Glaucous-winged Gull	<input type="checkbox"/> Red-eyed Vireo	<input checked="" type="checkbox"/> Common Yellowthroat
<input checked="" type="checkbox"/> Pelagic Cormorant	<input type="checkbox"/> American Kestrel	<input checked="" type="checkbox"/> Caspian Tern	<input type="checkbox"/> Gray Jay	<input checked="" type="checkbox"/> Wilson's Warbler
<input checked="" type="checkbox"/> American Bittern	<input checked="" type="checkbox"/> Merlin	<input checked="" type="checkbox"/> Common Tern	<input checked="" type="checkbox"/> Western Scrub Jay	<input checked="" type="checkbox"/> Western Tanager
<input checked="" type="checkbox"/> Great Blue Heron	<input checked="" type="checkbox"/> Peregrine Falcon	<input checked="" type="checkbox"/> Black Tern	<input checked="" type="checkbox"/> Steller's Jay	<input checked="" type="checkbox"/> Spotted Towhee
<input checked="" type="checkbox"/> Green Heron	<input checked="" type="checkbox"/> Gyrfalcon	<input checked="" type="checkbox"/> Common Murre	<input type="checkbox"/> Blue Jay	<input type="checkbox"/> Chipping Sparrow
<input checked="" type="checkbox"/> Black-crowned Night Heron	<input checked="" type="checkbox"/> Ring-necked Pheasant (I)	<input checked="" type="checkbox"/> Pigeon Guillemot	<input checked="" type="checkbox"/> American/Northwestern Crow	<input type="checkbox"/> Vesper Sparrow
<input checked="" type="checkbox"/> Turkey Vulture	<input type="checkbox"/> Spruce Grouse	<input checked="" type="checkbox"/> Marbled Murrelet	<input checked="" type="checkbox"/> Common Raven	<input checked="" type="checkbox"/> Savannah Sparrow
<input checked="" type="checkbox"/> Tundra Swan	<input type="checkbox"/> Blue Grouse	<input checked="" type="checkbox"/> Ancient Murrelet	<input type="checkbox"/> Horned Lark	<input checked="" type="checkbox"/> Fox Sparrow
<input checked="" type="checkbox"/> Trumpeter Swan	<input type="checkbox"/> White-tailed Ptarmigan	<input checked="" type="checkbox"/> Rhinoceros Auklet	<input checked="" type="checkbox"/> Purple Martin	<input checked="" type="checkbox"/> Song Sparrow
<input checked="" type="checkbox"/> Greater White-Fronted Goose	<input type="checkbox"/> Ruffed Grouse	<input checked="" type="checkbox"/> Rock Dove (I)	<input checked="" type="checkbox"/> Tree Swallow	<input checked="" type="checkbox"/> Lincoln's Sparrow
<input checked="" type="checkbox"/> Snow Goose	<input type="checkbox"/> California Quail	<input checked="" type="checkbox"/> Band-tailed Pigeon	<input checked="" type="checkbox"/> Violet-green Swallow	<input checked="" type="checkbox"/> White-throated Sparrow
<input checked="" type="checkbox"/> Ross's Goose	<input checked="" type="checkbox"/> Virginia Rail	<input checked="" type="checkbox"/> Mourning Dove	<input checked="" type="checkbox"/> Northern Rough-winged Swallow	<input checked="" type="checkbox"/> Golden-crowned Sparrow
<input checked="" type="checkbox"/> Brant	<input checked="" type="checkbox"/> Sora	<input checked="" type="checkbox"/> Barn Owl	<input type="checkbox"/> Bank Swallow	<input checked="" type="checkbox"/> White-crowned Sparrow
<input checked="" type="checkbox"/> Canada Goose	<input checked="" type="checkbox"/> American Coot	<input checked="" type="checkbox"/> Western Screech Owl	<input checked="" type="checkbox"/> Cliff Swallow	<input type="checkbox"/> Harris's Sparrow
<input checked="" type="checkbox"/> Wood Duck	<input type="checkbox"/> Sandhill Crane	<input checked="" type="checkbox"/> Great Horned Owl	<input checked="" type="checkbox"/> Barn Swallow	<input checked="" type="checkbox"/> Snow Bunting
<input checked="" type="checkbox"/> Green-winged Teal	<input checked="" type="checkbox"/> Pacific Golden Plover	<input checked="" type="checkbox"/> Snowy Owl	<input checked="" type="checkbox"/> Black-capped Chickadee	<input checked="" type="checkbox"/> Dark-eyed Junco
<input checked="" type="checkbox"/> Mallard	<input checked="" type="checkbox"/> Black-bellied Plover	<input checked="" type="checkbox"/> Northern Pygmy Owl	<input type="checkbox"/> Mountain Chickadee	<input checked="" type="checkbox"/> Lapland Longspur

<input checked="" type="checkbox"/> Northern Pintail	<input checked="" type="checkbox"/> Semipalmated Plover	<input type="checkbox"/> Spotted Owl	<input checked="" type="checkbox"/> Chestnut-backed Chickadee	<input type="checkbox"/> Black-headed Grosbeak
<input checked="" type="checkbox"/> Blue-winged Teal	<input checked="" type="checkbox"/> Killdeer	<input checked="" type="checkbox"/> Barred Owl	<input checked="" type="checkbox"/> Bushtit	<input type="checkbox"/> Lazuli Bunting
<input checked="" type="checkbox"/> Cinnamon Teal	<input checked="" type="checkbox"/> Greater Yellowlegs	<input type="checkbox"/> Long-eared Owl	<input checked="" type="checkbox"/> Red-breasted Nuthatch	<input checked="" type="checkbox"/> Red-winged Blackbird
<input checked="" type="checkbox"/> Northern Shoveler	<input checked="" type="checkbox"/> Lesser Yellowlegs	<input checked="" type="checkbox"/> Short-eared Owl	<input checked="" type="checkbox"/> Brown Creeper	<input type="checkbox"/> Western Meadowlark
<input checked="" type="checkbox"/> Gadwall	<input checked="" type="checkbox"/> Solitary Sandpiper	<input type="checkbox"/> Northern Saw-whet Owl	<input checked="" type="checkbox"/> Bewick's Wren	<input type="checkbox"/> Yellow-headed Blackbird
<input checked="" type="checkbox"/> Eurasian Widgeon	<input checked="" type="checkbox"/> Spotted Sandpiper	<input checked="" type="checkbox"/> Common Nighthawk	<input type="checkbox"/> House Wren	<input type="checkbox"/> Brewer's Blackbird
<input checked="" type="checkbox"/> American Widgeon	<input checked="" type="checkbox"/> Whimbrel	<input type="checkbox"/> Black Swift	<input checked="" type="checkbox"/> Winter Wren	<input checked="" type="checkbox"/> Brown-headed Cowbird
<input checked="" type="checkbox"/> Canvas Back	<input checked="" type="checkbox"/> Ruddy Turnstone	<input checked="" type="checkbox"/> Vaux's Swift	<input checked="" type="checkbox"/> Marsh Wren	<input checked="" type="checkbox"/> Bullock's Oriole
<input checked="" type="checkbox"/> Red Head	<input checked="" type="checkbox"/> Surfbird	<input checked="" type="checkbox"/> Anna's Hummingbird	<input type="checkbox"/> American Dipper	<input type="checkbox"/> Gray-crowned Rosy Finch
<input checked="" type="checkbox"/> Ring-necked Duck	<input checked="" type="checkbox"/> Sanderling	<input checked="" type="checkbox"/> Rufous Hummingbird	<input checked="" type="checkbox"/> Golden-crowned Kinglet	<input type="checkbox"/> Pine Grosbeak
<input checked="" type="checkbox"/> Greater Scaup	<input checked="" type="checkbox"/> Semipalmated Sandpiper	<input checked="" type="checkbox"/> Belted Kingfisher	<input checked="" type="checkbox"/> Ruby-crowned Kinglet	<input checked="" type="checkbox"/> Purple Finch
<input checked="" type="checkbox"/> Lesser Scaup	<input checked="" type="checkbox"/> Western Sandpiper	<input type="checkbox"/> Lewis's Woodpecker	<input type="checkbox"/> Western Bluebird	<input checked="" type="checkbox"/> House Finch
<input checked="" type="checkbox"/> Harlequin Duck	<input checked="" type="checkbox"/> Least Sandpiper	<input checked="" type="checkbox"/> Red-breasted Sapsucker	<input type="checkbox"/> Mountain Bluebird	<input checked="" type="checkbox"/> Red Crossbill
<input checked="" type="checkbox"/> Black Scoter	<input checked="" type="checkbox"/> Baird's Sandpiper	<input checked="" type="checkbox"/> Downy Woodpecker	<input checked="" type="checkbox"/> Townsend's Solitaire	<input type="checkbox"/> White-winged Crossbill
<input checked="" type="checkbox"/> Surf Scoter	<input checked="" type="checkbox"/> Pectoral Sandpiper	<input checked="" type="checkbox"/> Hairy Woodpecker	<input checked="" type="checkbox"/> Swainson's Thrush	<input type="checkbox"/> Common Redpoll
<input checked="" type="checkbox"/> White-winged Scoter	<input checked="" type="checkbox"/> Dunlin	<input type="checkbox"/> Three-toed Woodpecker	<input checked="" type="checkbox"/> Hermit Thrush	<input checked="" type="checkbox"/> Pine Siskin
<input checked="" type="checkbox"/> Common Goldeneye	<input checked="" type="checkbox"/> Short-billed Dowitcher	<input checked="" type="checkbox"/> Northern Flicker	<input checked="" type="checkbox"/> American Robin	<input checked="" type="checkbox"/> American Goldfinch
<input checked="" type="checkbox"/> Barrow's Goldeneye	<input checked="" type="checkbox"/> Long-billed Dowitcher	<input checked="" type="checkbox"/> Pileated Woodpecker	<input checked="" type="checkbox"/> Varied Thrush	<input checked="" type="checkbox"/> Evening Grosbeak
<input checked="" type="checkbox"/> Bufflehead	<input checked="" type="checkbox"/> Common Snipe	<input checked="" type="checkbox"/> Olive-sided Flycatcher	<input type="checkbox"/> Northern Mockingbird	<input checked="" type="checkbox"/> House Sparrow(l)
<input checked="" type="checkbox"/> Hooded Merganser	<input checked="" type="checkbox"/> Wilson's Phalarope	<input checked="" type="checkbox"/> Western Wood-Pewee	<input checked="" type="checkbox"/> American Pipit	
<input checked="" type="checkbox"/> Common Merganser	<input checked="" type="checkbox"/> Red-necked Phalarope	<input checked="" type="checkbox"/> Willow Flycatcher	<input checked="" type="checkbox"/> Bohemian Waxwing	TOTAL BIRDS: 236

Table B-9. Species and environments that are limited to either the west or north shore of Maury Island.

Cucumber	Geoduck	Salmon sp	PHS - Urban Natural Open Space, Wetlands, Estuarine
Smelt	Armoring	Large woody debris	Marsh
Marine riparian vegetation	Eelgrass	Expline	Dunegrass
Nfloatkelp	Softbrown kelp	Salt marsh	Low marsh
Mixed marsh	Seagrass	Shoreline description	Substrate description
Stream mouths	Sargassum	Hard shelled clam (west side)	Crab (north side)

