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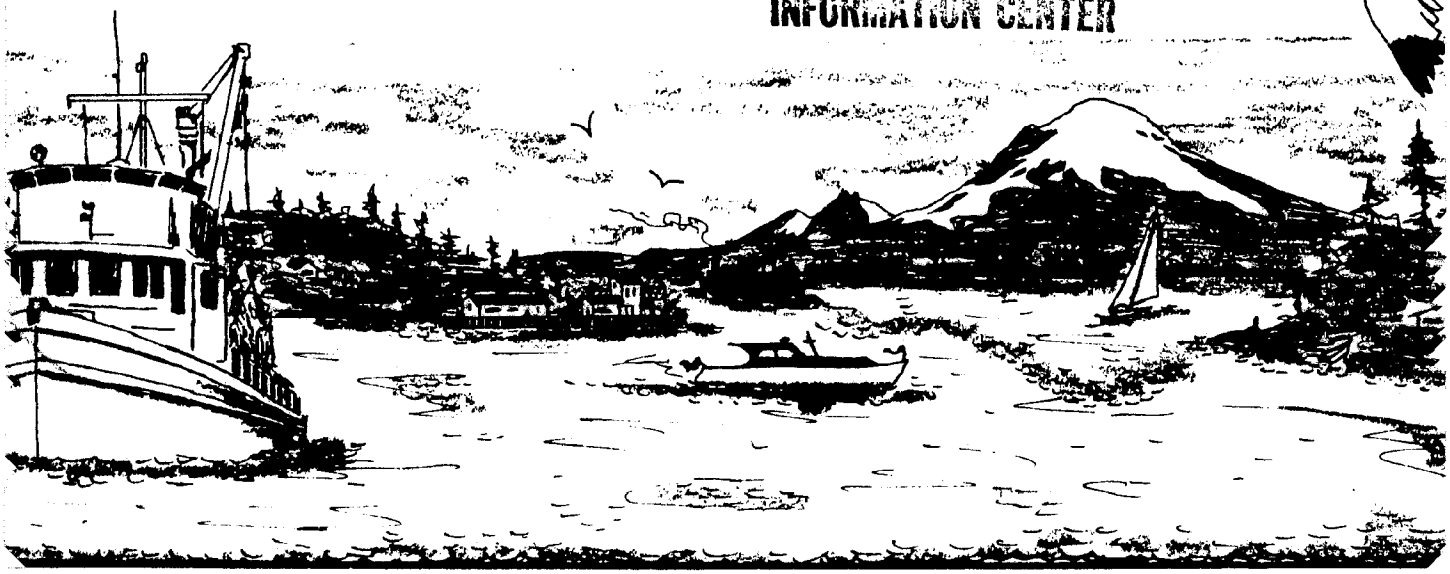

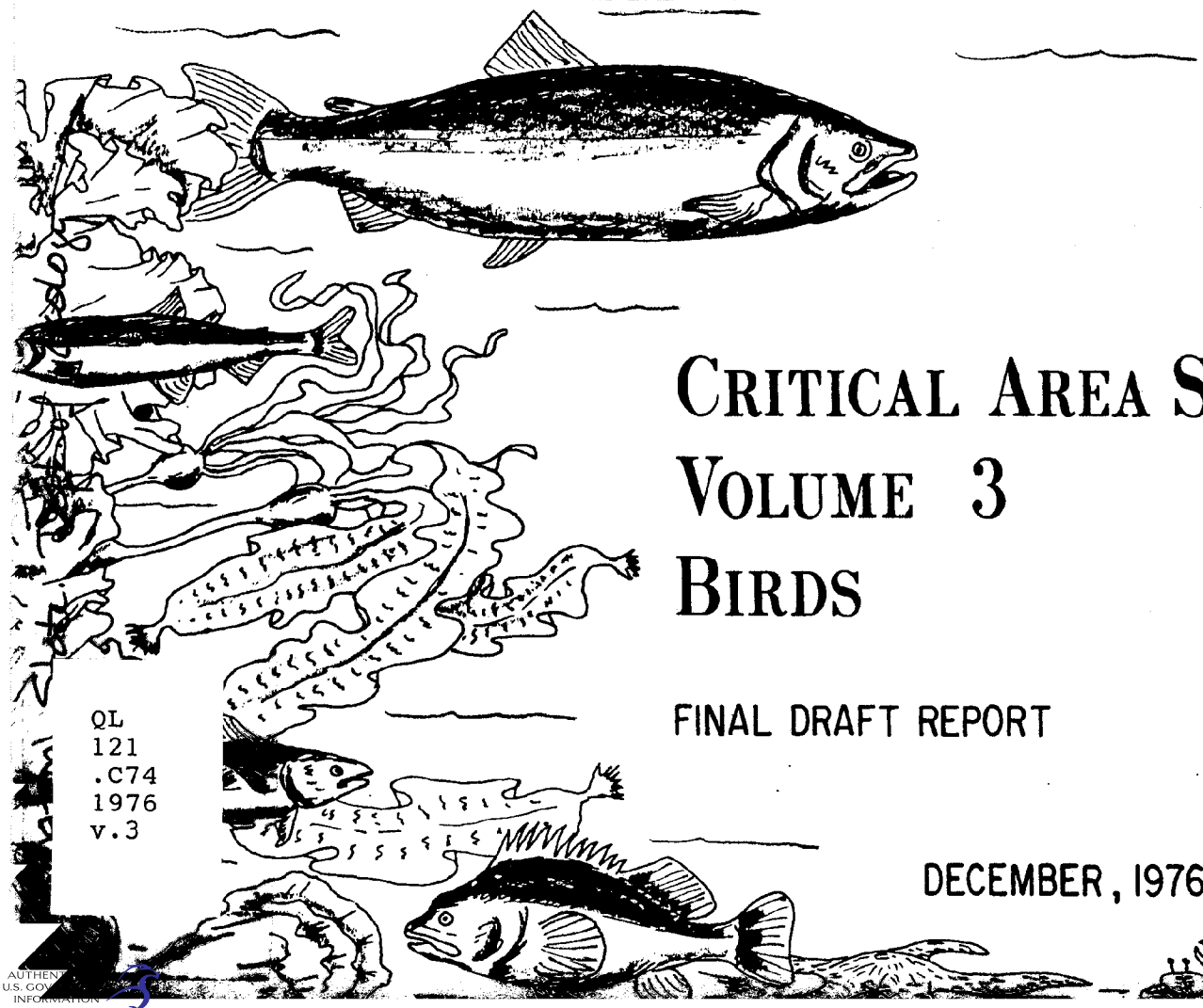

CRITICAL AREA STUDY
VOLUME 3
BIRDS

FINAL DRAFT REPORT

DECEMBER, 1976

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CRITICAL AREA STUDY

VOLUME III

BIRDS

AUG 15 1977

By

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INDEX TO BIRD SPECIES

CODE NO.	COMMON NAME
B-1	Common Loon
B-2	Arctic Loon
B-3	Red Throated Loon
B-4	Red Necked Grebe
B-5	Horned Grebe
B-6	Eared Grebe
B-7	Western Grebe
B-8	Double-Crested Cormorant
B-9	Brandt's Cormorant
B-10	Pelagic Cormorant
B-11	Whistling Swan
B-12	Western Canada Goose
B-13	Black Brandt
B-14	White-Fronted Goose
B-15	Snow Goose
B-16	Mallard
B-17	Pintail
B-18	Green-Winged Teal
B-19	American Wigeon
B-20	Northern Shoveler
B-21	Canvasback
B-22	Greater Scaup
B-23	Lesser Scaup
B-24	Common Goldeneye
B-25	Barrow's Goldeneye
B-26	Bufflehead
B-27	Old Squaw
B-28	Harlequin Duck
B-29	White-Winged Scoter
B-30	Surf Scoter

INDEX TO BIRD SPECIES (CONTINUED)

CODE NO.	COMMON NAME
B-31	Black Scoter
B-32	Common Merganser
B-33	Red-Breasted Merganser
B-34	American Coot
B-35	Parasitic Jaeger
B-36	Glaucous-Winged Gull
B-37	Western Gull
B-38	Herring Gull
B-39	California Gull
B-40	Ring-Billed Gull
B-41	Mew Gull
B-42	Bonaparte's Gull
B-43	Heermann's Gull
B-44	Thayer's Gull
B-45	Common Tern
B-46	Common Murre
B-47	Pigeon Guillemot
B-48	Marbled Murrelet
B-49	Cassin's Anklet
B-50	Rhinoceros Anklet
B-51	Tufted Puffin
B-52	Wilson's Phalarope
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B-54	Great Blue Heron
B-55	Whimbrel
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B-58	Greater Yellowlegs
B-59	Lesser Yellowlegs
B-60	Red Knot
B-61	Pectoral Sandpiper

INDEX TO BIRD SPECIES (CONTINUED)

CODE NO.	COMMON NAME
B-62	Least Sandpiper
B-63	Dunlin
B-64	Short-Billed Dowitcher
B-65	Long-Billed Dowitcher
B-66	Western Sandpiper
B-67	Sanderling
B-68	Black Oystercatcher
B-69	Semi-Palmated Plover
B-70	Killdeer
B-71	Black-Bellied Plover
B-72	Surfbird
B-73	Ruddy Turnstone
B-74	Black Turnstone
B-75	Belted Kingfisher
B-76	Northern Bald Eagle
B-77	Osprey
B-78	Northwestern Crow

INTERPRETATION OF BIRD FACT SHEETS AND MAPS

Each fact sheet is headed with the accepted common and scientific names of the bird species. Nomenclature follows the A.O.U. Checklist of North American Birds, Fifth Edition, 1957, and as revised by the 32nd Supplement, 1973. These fact sheets and associated maps (if critical areas were determined for a species) are an initial evaluation of presently available information, and by no means should be construed as a final statement on these bird species. (See Introductory Volume.)

With two exceptions all of the birds on DOE's list (Appendix A, Introductory Volume) were reviewed. The exception was that two cormorant subspecies were combined with the double-crested cormorant (B-8) (see fact sheet foot note). For this and some other bird species, subspecies designations were not used on the fact sheets because literature information was not that specific.

Life History

A brief description of migration, breeding, nesting, and feeding habits is presented for each species. Generally the reader is referred to two previous works of the Washington Departments of Game and Ecology (Eaton, 1975 and Salo, 1975) for this information.

Washington Distribution

Seasonal and spatial distribution of the species and estimates of relative abundance are provided. This information is important for determing how dependent a species is on marine habitats, when it is in the marine and estuarine waters of Washington State, and thus, when and where it would be most affected by man's activities.

Habitat Requirements

A brief description of the marine and estuarine habitats utilized by the species is provided. The kinds of usage, i.e., resting, feeding, nesting, are also noted. The general habitat types, i.e., rock, sand, mud, mixed: coarse (boulder, gravel, sand), mixed: fine (gravel, sand, mud), eelgrass bed, kelp bed, salt marsh and open water defined by the Department of Ecology are noted in Table 1; but in the text more geographically descriptive terms (Wahl, 1976), i.e., ocean waters, major entrance channels, sandy ocean beach, rocky ocean beach, channels - submerged reefs, rocky islands, sand islands, tidal flats, small estuary, large estuary, salt marsh, sandy spit, jetty, sandy beach of protected waters, Columbia River Islands, protected waters, are used. (See Table 1 plus its preface for definition of terms.)

Critical Habitat Areas

The overall guidelines for determining critical habitats were those defined by the Washington Department of Ecology as:

1. The area supports a population of a specie(s) that not only consistently reproduces itself but because of favorable environmental conditions (currents, water temperature, salinity, etc.) provides the major source of recruitment for adjacent areas or regions whose populations do not consistently reproduce themselves.

2. The area consists of a habitat type or types that provide either shelter, food, or other environmental necessities during a critical part of a species life history. For example: Nesting sites or shelter from predators during early life history stages.

The sources of information used in determining these areas were literature and personal interviews conducted by Beak Consultants, Inc., 1975, Salo, 1975, Eaton, 1975, and additional persons and materials investigated by the author. (See References Section.) Critical areas that are denoted in the fact sheets are always underlined where they are mapped.

The majority of the critical habitat areas are included because of their importance as feeding and resting stopover areas for birds migrating along the Pacific Flyway and for their value as wintering sites. In addition, several important nesting areas, primarily rocky islands for cormorants, gulls, and seabirds are noted. The determining factor in most cases was the numbers of birds using the area and the uniqueness of the site compared to surrounding areas. See maps and accompanying legends for critical habitat designations.

One very important point should be remembered by the user of this material. The critical habitat areas noted are by no means to be interpreted as the only critical bird habitats in the marine environs of Washington. This is an initial listing based on a limited amount of data and the subjective judgment of biologists who have studied these speces and areas. As will be obvious to the reader, in many cases the

areas are described in very general terms because of the lack of specific information on habitat types in an area and the usage of specific areas by the species involved. For example, in many cases Willapa Bay is listed as a critical area, but it is often difficult to break bird usage down more specifically. The literature often reports population counts in terms of broad areas such as Skagit Flats, Grays Harbor, and Willapa Bay. More site specific delineation was possible in some cases where local biologists had conducted site specific studies, e.g., studies of Smith and Mudd (1975). There are many data gaps, as will be discussed in the next section. The major gaps are the lack of systematic censuses of bird populations and the paucity of ecological studies on their habitat requirements in Washington. Several marine areas have been studied very little, and in some cases not at all. Thus, the reader must remember that this is a first look at defining critical habitats. Additional studies and critical reviews by other ornithologists will be needed to better define these sites and to add new areas.

In many cases there were areas where populations of a species did not concentrate as they did in other areas, often due to less acreage being available. But many of these areas were still thought to be important. In some cases because it was the only population of the species in a region, such as many species at Nisqually Flats. In such cases these areas were not mapped as critical habitat areas, but were mentioned as being other important concentration areas. Further studies might reveal such areas to be even more important than they are thought to be at present. See maps and accompanying legends for important habitat designations.

The MSNW analysis revealed that a species-specific approach for birds did not define all areas that should be considered critical. Certain marine sites were not listed for any one species, yet, these areas have concentrations of a diversity of bird species. From the input of T. R. Wahl, consultant to MSNW, selected areas were labeled multi-species critical areas and designated differently than single species critical areas on the USC&GS overlays (see map legend). These areas are briefly described in Table 2 also prepared by Mr. Wahl.

As a final note, we want the user to once again remember that the critical and important habitat areas mapped are by no means all inclusive. This is an initial effort that must be updated as new information is developed which may further define designated areas or designate new areas.

Data Gaps

The major data gaps are the lack of systematic censusing of bird populations in the marine habitats of Washington and the lack of ecological studies on the breeding, nesting, feeding, and resting requirements of these bird populations in the State. (Salo 1975, Manual 1976, Wahl 1976, Hocutt 1976, Welch 1976, Jeffrey 1976.) The majority of the censusing has been done by the U.S. Fish and Wildlife Service in the Willapa Bay, Washington Islands, Dungeness, Nisqually, and San Juan Islands National Wildlife Refuges and by the Washington Department of Game in the Padilla, Samish, Fidalgo, Skagit and Port Susan Bays areas. The major emphasis of these counts has been on waterfowl. Additional ecological studies include the

following: A fairly thorough survey of avifauna, particularly nesting seabirds in the Washington Islands National Wildlife Refuge, was conducted in 1974 (904). A preliminary survey of seabird colonies in the San Juan Archipelago and the Strait of Juan de Fuca was carried out in 1973. A one year study of the avifauna of much of Grays Harbor was conducted in 1974-1975. Studies of the status of seabirds in the offshore zone of the States are presently in progress (Wahl, 1976).

Ecological studies of a few breeding seabirds and shorebirds are also in progress (Manual, 1976). A few other ecological and distributional studies have been accomplished in the past (131, 132, Wahl and Paulson, 1973 and others in the reference section).

Field observations of amateur bird watchers have also been recorded in some areas.

Most of these field studies and observations have occurred in the major well known birding areas of the State, e.g., Willapa Bay, Nisqually, Dungeness, Skagit Flats. Many areas including much of the outer coast, Strait of Juan de Fuca, Hood Canal and South Puget Sound, have been censused very little. Many species, particularly non-game species, e.g., shorebirds, cormorants and grebes, have been studied only sparsely. For example, Wahl (1976) observed a flock of 500 red-necked grebes on the east side of Port Angeles Harbor near Green Point in early September, 1976. This was one of the largest flocks ever recorded in the State and the first large flock for that area. Not only have several areas not been adequately studied in the past, but budget cuts by the U.S. Fish and Wildlife Service for National Wildlife Refuge funds will possibly decrease the amount of sampling that

will be done in Willapa Bay, Washington Islands, Dungeness, Nisqually, and San Juan Islands National Wildlife Refuges in the future (Welch, 1976). Another area that has been little studied is the use of the outer continental shelf by seabirds (Wahl, 1976). The continued existence of many species, e.g., seabirds on nesting islands and other birds in waters within the State of Washington will depend on the continuing productivity of the continental shelf waters, from the "three mile State limit" to at least the edge of the continental shelf. Seabirds are much more abundant over shelf waters than farther offshore over pelagic waters. In addition, several species nesting in Washington (see Table 1) are dependent on food sources of the shelf during the entire year. In addition, during the course of a year, probably several million additional birds migrate over coastal waters enroute to and from nesting areas in both northern and southern hemispheres and wintering areas to the north or south. The biological health of Washington's continental shelf affects populations of birds over much of the Pacific Ocean (Wahl, 1976).

Another major data gap is the lack of detailed habitat type maps for the marine areas of the State. In many cases it is impossible to do site specific critical habitat mapping because the distribution of basic habitats in the area is not known. This is in the process of being done by the Washington Department of Game and will be an important step in the process of delineating critical habitats.

The following are some specific recommendations for filling in some of the data gaps: (Wahl, 1976, Welch, 1976, Manual, 1976.)

1. Conduct summer counts to supplement and up-date data on breeding colonies and non-breeding populations.

2. Determine peak numbers and population turnover at important migration stopover locations.

3. Conduct counts to determine precise locations of feeding and resting areas, water habitats and possibly adjacent land locations (e.g., ducks and gulls move back and forth depending on tides).

Not only should these studies be conducted in known important areas but should be expanded to many unstudied sites. A good source for determining some of these unstudied areas is Table 2, developed by Wahl (1976).

Another recommendation to aid in the filling of data gaps and to coordinate such efforts would be the establishment of a data bank for coordinating bird studies in marine habitats of the State. The role of this institution would be to maintain data on an ongoing basis, provide a communication medium for information exchange between federal and state agencies, universities, private researchers and amateur birding groups, keep up with who's doing what research, call attention to research needs, advise agencies and private organizations on problems associated with proposed commercial, industrial and recreational developments and coordinate Washington bird studies with other national and world-wide programs. One of the major functions would be to coordinate and organize efforts of amateurs who enjoy doing field work on weekends, but don't have the time or desire to follow through on detailed data analysis and publication of results. They could assist researchers on specific projects and also could conduct systematic census counts, particularly in sites of their local area where there is a lack of species distribution and population data.

The data bank could publish a quarterly mimeo bulletin to be sent to agencies and concerned individuals. This would not be a conservation paper, but a research information bulletin. One of its major tasks would be to review and computerize all available data to date, i.e., field notes and files of amateurs and professionals and to steadily accumulate ongoing input. Such a bank would need to be administered by a compiler/administrator who has contacts with all agencies, is familiar with world literature, and one who has ability to edit past and future reports.

On the fact sheets a few brief additional statements will be made for certain species who might have specific data gaps. In general, the reader should refer to the previous discussions for information on data gaps.

Table 3 presents a Bird Data Gap Matrix.

References

The major sources utilized during the preparation of the fact sheets are presented.

TABLE 1 - BIRD SPECIES BY HABITAT MATRIX

Primary Habitats (D.O.E.)

Habitats utilized by bird species.

Habitat descriptions are those of Department of Ecology.

x - occurs in habitat

xx - preferred habitat type

Seasonal Occurrence (Generalized)

SP - Spring migrant, April, May

SU - Summer visitor, June

F - Fall migrant, July to November

W - Winter visitor, December to March.

Abundance in Season

C = Common, often seen or heard in appropriate habitat

U = Uncommon, usually present, not always seen or heard

R = Rare, present in appropriate habitats only in small numbers, seldom seen or heard

(N) = after species name, nests in study area

Geographical Habitat Types

x - occurs in habitat

xx - preferred habitat type

The following is a description of the geographical habitats utilized by the bird species:

Ocean Waters - From beach to 3.0 miles offshore. Includes all types of bottom configurations and types. Ocean coast. See next category.

Major Entrance Channels - Channels where currents and food resources are conspicuously concentrated: Columbia River mouth, entrances to Willapa Bay and Grays Harbor, and Admiralty Inlet and Deception Pass where all southern waters connect with Straits of Juan de Fuca.

Sandy Ocean Beach - Land area only, of sand and/or mixed fine.

Rocky Ocean Beach - Land area only, predominately of large rocks and/or mixed coarse.

Channels, Submerged Reefs - Water areas in protected or "inside" waters, significant for feeding concentrations. (Large open straits often do not show as much biological activity as adjoining channels between islands, etc.)

Rocky Islands - Land areas both off the ocean coast and inside waters, including those covered with top-soil and vegetation (Destruction and Protection Islands, etc.)

Sandy Islands - Land areas, including gravel and sand types, in Willapa Bay, Grays Harbor, Puget Sound.

Tidal Flats - Both unexposed and exposed stages - not an immediate part of an estuary itself but including flats below beaches as on inside of Long Beach Peninsula, etc.

Small Estuary - Mouths of small streams in inside waters with no significant salt marsh or streams emptying directly into the ocean on the coast behind accreted spits, etc. Includes both land and water areas. Rated low individually, but important as a category in total.

Large Estuary - River delta with salt marsh and sloughs, but for purposes here not including large estuarine systems like Willapa Bay and Grays Harbor. Land and water areas.

Salt Marsh - Large, not in immediate estuary itself, and including only land area of marsh itself. (As at Ledbetter Point, adjoins tidal flats. Because of extent, provides significant habitat for specialized birds, like Pectoral and Sandpipers).

TABLE 1

PRIMARY HABITATS (D.O.E.)

Species		Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water	Seasonal Occurrence SP	SU	F	W
Common Loon										xx	C	U	C	C
Arctic Loon										xx	C	U	C	C
Red-throated Loon										xx	C	R	C	C
Red-necked Grebe										xx	C	R	C	C
Horned Grebe										xx	C	R	C	C
Eared Grebe										xx	U	-	U	U
Western Grebe										xx	C	U	C	C
Sooty Shearwater										xx	C	C	C	U
Forktails Petrel	(N)	N								xx	C	C	C	R
Leach's Forktails Petrel	(N)	N								xx	C	C	C	C
Double-Crested Cormorant	(N)	N								xx	C	C	C	C
Brandt's Cormorant	(N)	N								xx	C	C	C	C
Pelagic Cormorant	(N)	N								xx	C	C	C	C
Great Blue Heron	(N)	x		x*		x	x	x	x		C	C	C	C
Whistling Swan				x					x	x	C	-	C	C

Sandy Spit - Accreted land area of sand and/or gravel adjunct to large island or mainland.

Jetty - Land area only of rock breakwaters and groins. Man-made habitat now very significant for several species of birds in Washington (and likely also for feeding fish and marine mammals). Substitute rocks, but probably better because of location at important channels.

Sandy Beach - Land area only of undeveloped sand/gravel shore in protected waters.

Rocky Beach - Land area only of rocky beaches in protected waters.

Columbia River Islands - Wahkiakum County islands. Upland areas probably important here - different from most of rest of coastal areas in this respect.

Protected Waters - Small harbors, etc., in Puget Sound, often in developed areas.

TABLE 1 (CONTINUED)

CRITICAL AREAS FROM T. R. WAHL

Species	Designated by △No.▽ on Maps	Comments
Common Loon		Widespread along coast, in shallow bays, etc., abundant in many places.
Arctic Loon	4, e and c, 75, 83, 89, 93-98, 108, examples	Usually in flocks, in deep water channels, etc., off ocean beaches.
Red-throated Loon		Widespread
Red-necked Grebe	especially 92-98, 102, 107, (examples only)	Widespread.
Horned Grebe		Widespread.
Eared Grebe		Local Migrant
Western Grebe	52, 32, 33, 35, Hood Canal, 55-58, 68, 75, 84-86, 102-107	Some off ocean beaches.
Sooty Shearwater	3, 5, 7, all south coast beaches, 26	Often flocks of thousands in Grays Harbor, Willapa Bay, Columbia River Channel.
Forktails Petrel	14, 16, 17, 22, 23, 26	Nests on offshore islands, feeds over Continental Shelf, offshore.
Leach's Forktails Petrel	14, 16, 17, 22, 23, 26	Nests on offshore islands, feeds over Continental Shelf, offshore.
Double-crested Cormorant	Offshore rocks, 91	
Brandt's Cormorant	Widespread	Nests on ocean coast, some winter in Puget Sound.
Pelagic Cormorant	In Winter	
Great Blue Heron		
Whistling Swan	5a-d, 7c, 60, 68, 101	100+ winter at 68, 20 to 35 at 101, large numbers in Columbia River area.

TABLE 1 (CONTINUED)

GEOGRAPHICAL TYPE USED (See Description)

Species	Ocean Waters	Major Entrance Channels	Ocean Beaches Sandy	Ocean Beaches Rocky	Channels, Submerged Reefs, etc.	Islands Rocky	Islands Sandy	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Sandy Spits	Ocean Jetties	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Columbia River Islands	Protected Harbors etc.
Common Loon	x	x			x			x	x	x							x
Arctic Loon	x	x			xx												
Red-throated Loon	x	x			x			x	x	x							x
Red-necked Grebe	x	x			x			x	x	x							x
Horned Grebe		x			x			x	x	x							x
Eared Grebe					x			x		x							x
Western Grebe	x	x			x			x		x							x
Sooty Shearwater	xx	xx															
Forktails Petrel	x					xx											
Leach's Forktails Petrel	x					xx											
Double-crested Cormorant	x	xx			x	xx			x	x			x		x		x
Brandt's Cormorant	x	xx			x	xx			x	x			xx		x		x
Pelagic Cormorant	x	xx			xx	xx			x	x			xx		x		x
Great Blue Heron			x	x	x	x	x	x	x	x	x	x	x	x	x		x
Whistling Swan								x		x	x						

TABLE 1 (CONTINUED)

GEOGRAPHICAL TYPE USED (See Description)

Species	Ocean Waters	Major Entrance Channels	Ocean Beaches Sandy	Ocean Beaches Rocky	Channels, Submerged Reefs, etc.	Islands Rocky	Islands Sandy	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Sandy Spits	Ocean Jetties	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Columbia River Islands	Protected Harbors etc.
Canada Goose							x	x	x	x	x	x					
Brant							x	x		x		x		x			x
White-fronted Goose								x		x	x						
Snow Goose								x		xx	x						
Mallard							x	x	x	x	x	x					x
Pintail							x	x		x	x						x
Green-winged Teal							x	x		x	x						x
American Wigeon							x	x		x	x						x
Northern Shoveler									x	x							x
Canvasback								x		x							x
Greater Scaup								x		x							x
Lesser Scaup								x		x							x

TABLE 1 (CONTINUED)

PRIMARY HABITATS (D.O.E.)

Species		Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water	Seasonal Occurrence SP	SU	F	W
Canada Goose	(N)			x *					x	x	C	C	C	C
Brant				x		x	xx			x	C	-	C	C
White-fronted Goose				x					x	x	C	-	C	U
Snow Goose				x					x	x	C	-	C	C
Mallard	(N)			x					x	x	C	C	C	C
Pintail				x						x	C	-	C	C
Green-winged Teal				x						x	C	-	C	C
American Wigeon				x						x	C	-	C	C
Northern Shoveler				x						x	C	-	C	C
Canvasback				x						x	C	-	C	C
Greater Scaup				x						x	C	U	C	C
Lesser Scaup				x						x	C	U	C	C

TABLE 1

PRIMARY HABITATS (D.O.E.)

Species		Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water	Seasonal Occurrence SP	SU	F	W
Common Goldeneye				x						x	C	R	C	C
Barrow's Goldeneye				x						x	C	-	C	C
Bufflehead				x						x	C	-	C	C
Oldsquaw				(x)						x	C	-	C	C
Harlequin Duck		x								x	C	U	C	C
White-winged Scoter				x						x	C	C	C	C
Surf Scoter				x						x	C	C	C	C
Black Scoter				x						x	U	R	U	U
Ruddy Duck				x						x	C	-	C	C
Hooded Merganser				x						x	-	-	C	C
Common Merganser				x						x	C	-	C	C
Red-breasted Merganser				x						x	C	R	C	C
Bald Eagle	(N)			x							C	C	C	C
Osprey	(N)									x	U	U	U	-
American Coot				x						x	C	-	C	C

TABLE 1 (CONTINUED)

CRITICAL AREAS FROM T. R. WAHL

Species	Designated by △No.△ on Maps	Comments
Canada Goose		
Brant	5, 7, 32, 84-86 esp., also 102 to 108, etc.	
White-fronted Goose		
Snow Goose	5, 68	Especially Skagit Flats - abundant locally.
Mallard		
Pintail		
Green-winged Teal		
American Wigeon		Flocks may include up to five percent *A. penelope*.
Northern Shoveler		
Canvasback		
Greater Scaup		
Lesser Scaup		

TABLE 1 (CONTINUED)

CRITICAL AREAS FROM T. R. WAHL

Species	Designated by No. on Maps	Comments
Common Goldeneye		
Barrow's Goldeneye		Found in more sheltered waters than common goldeneye.
Bufflehead		
Oldsquaw		Winters in deeper waters than other diving ducks.
Harlequin		Habits reefs, rocky islands, spits - present most of year.
White-winged Scoter		Abundant and widespread in winter, local concentrations in summer.
Surf Scoter		Abundant and widespread in winter, local concentrations in summer.
Black Scoter		Common locally.
Ruddy Duck		
Hooded Merganser		
Common Merganser		Usually in river mouths, brackish waters in winter.
Red-breasted Merganser		
Bald Eagle	5, 13, 19, 68, 75, 85, 86, 91, etc., 101, 105.	Common in San Juan Islands; in Puget Sound Flats and ocean coast, especially in winter.
Osprey		Casual nesting in Puget Sound, San Juan Islands.
American Coot		

TABLE 1 (CONTINUED)

GEOGRAPHICAL TYPE USED (See Description)

Species	Ocean Waters	Major Entrance Channels	Ocean Beaches Sandy	Ocean Beaches Rocky	Channels, Submerged Reefs, etc.	Islands Rocky	Islands Sandy	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Sandy Spits	Ocean Jetties	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Columbia River Islands	Protected Harbors etc.
Common Goldeneye	x							x	x	x							x
Barrow's Goldeneye								x	x								xx
Bufflehead								x	x	x							xx
Oldsquaw	x	xx															x
Harlequin Duck	x	x										x	x		x		x
White-winged Scoter	xx	xx							x	x							x
Surf Scoter	xx	xx							x	x							x
Black Scoter	x	x							x	x							x
Ruddy Duck								x		x							x
Hooded Merganser								x	x	x							xx
Common Merganser								x	x	x							x
Red-breasted Merganser		x						x	x	x		x					x
Bald Eagle (N)			x	x				x	x	x				x	x		
Osprey (N)								x	x	x				x			
American Coot								x		x						x	x

TABLE 1 (CONTINUED)

GEOGRAPHICAL TYPE USED (See Description)

Species	Ocean Waters	Major Entrance Channels	Ocean Beaches Sandy	Ocean Beaches Rocky	Channels, Submerged Reefs, etc.	Islands Rocky	Islands Sandy	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Sandy Spits	Ocean Jetties	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Columbia River Islands	Protected Harbors etc.
Black Oystercatcher				x									x		x		
Semipalmated Plover			x					x	x	x		x					
Snowy Plover (N)			x									x		x			
Killdeer (N)								x	x	x		x		x			
American Golden Plover											x	x		x			
Black-bellied Plover			x					xx	x	x	x	x		x			
Surfbird				x								x	xx		x		
Ruddy Turnstone				x				x			x	x	x		x		
Black Turnstone				x				x				x	xx		x		
Common Snipe										x	x						
Whimbrel			x					x		x	x	x		x			
Spotted Sandpiper									x	x		x			x		
Wandering Tattler				x									xxx				
Greater Yellowlegs								x	x	x	x	x		x			
Lesser Yellowlegs								x	x	x	x	x		x			

TABLE 1 (CONTINUED

CRITICAL AREAS FROM T. R. WAHL

Species	Designated by No. on Maps	Comments
Black Oystercatcher	13, 14, 16, 22, 23, 34, 91	Regularly in small numbers nesting offshore rocks in Puget Sound.
Semipalmated Plover		
Snowy Plover	5a, h	Nests Leadbetter Point, Point Damon.
Killdeer		
American Golden Plover	5a, 7	Scattered small numbers, largest at WB, GH (usually in uplands at GH).
Black-bellied Plover	5, 7, 85-86	Large numbers, occurs widespread in small numbers.
Surfbird	3, 7a, 13, 14, 16, 17, 22, 23, 73, 91 esp.	Common in migration and winter in suitable habitat.
Ruddy Turnstone		Unlike Black, often in saltmarsh
Black Turnstone	3, 7a, 13, 14, 16, 17, 22, 23, 73 91 esp.	See Surbird.
Common Snipe		
Whimbrel		
Spotted Sandpiper		
Wandering Tattler	3, 7a, 13, 14, 16, 17, 22, 23 esp.	Occasional in Puget Sound.
Greater Yellowlegs		
Lesser Yellowlegs		

TABLE 1 (CONTINUED)

PRIMARY HABITATS (D.O.E.)

Species	Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water	Seasonal Occurrence SP	SU	F	W
Red Knot			x							C	-	C	-
Rock Sandpiper	x			x						U	-	U	U
Pectoral Sandpiper			x					x		U	-	C	-
Baird's Sandpiper		x	x					x		U	-	C	-
Least Sandpiper		x	x					x		C	-	C	U
Dunlin		x	x					x		C	-	C	C
Short-billed Dowitcher			x							C	-	C	-
Long-billed Dowitcher			x							C	-	C	-
Western Sandpiper		x						x		C	-	C	U
Marbled Godwit		x	x		x					U	-	C	-
Sanderling		x	x							C	-	C	C
Red Phalarope			x						x	R	-	C	R
Wilson's Phalarope			x							U	U	U	-
Northern Phalarope			x						x	C	-	C	-

TABLE 1 (CONTINUED)

GEOGRAPHICAL TYPE USED (See Description)

Species	Ocean Waters	Major Entrance Channels	Ocean Beaches Sandy	Ocean Beaches Rocky	Channels, Submerged Reefs, etc.	Islands Rocky	Islands Sandy	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Sandy Spits	Ocean Jetties	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Columbia River Islands	Protected Harbors etc.
Red Knot			x					xx		xx					x		
Rock Sandpiper				x		xx						x	xx		x		
Pectoral Sandpiper										x	x						
Baird's Sandpiper			x					x		x	x	x		x		x	
Least Sandpiper								x	x	x	x	x		x		x	
Dunlin			xx					xx	x	x	x	x		x			
Short-billed Dowitcher								x	x	x				x			
Long-billed Dowitcher								x	x	x				x		x	
Western Sandpiper			x					x	x	x	x	x		x		x	
Marbled Godwit			x					x		x		x					
Sanderling			xx					x	x	x		xx		x			
Red Phalarope	x																
Wilson's Phalarope								x		x							
Northern Phalarope	xx	x			x			x	x	x	x						

TABLE 1 (CONTINUED)

CRITICAL AREAS FROM T. R. WAHL

Species	Designated by No. on Maps	Comments
Red Knot	5a, f, g, 7b, c, f, g, h esp.	Small numbers elsewhere.
Rock Sandpiper		As Surfbird, Black Turnstone, smaller numbers.
Pectoral Sandpiper		Saltmarshes, saltmarsh sloughs.
Baird's Sandpiper		Relatively widespread in small numbers.
Least Sandpiper		
Dunlin		Abundant wintering species.
Short-billed Dowitcher		
Long-billed Dowitcher		
Western Sandpiper		
Marbled Godwit	5, 7f-h	Small numbers elsewhere.
Sanderling		Most on sandy ocean beaches in winter.
Red Phalarope		
Wilson's Phalarope		Uncommon in Western Washington.
Northern Phalarope		

TABLE 1 (CONTINUED)

PRIMARY HABITATS (D.O.E.)

Species		Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water	Seasonal Occurrence SP	SU	F	W
Pomarine Jaeger										x	C	U	C	R
Parasitic Jaeger										x	C	U	C	-
Glaucous-winged Gull	(N)	x	x	x	x	x	x	x		x	C	C	C	C
Western Gull	(N)	x	x	x	x	x	x	x		x	C	C	C	C
Herring Gull		x	x	x	x	x	x	x		x	C	-	U	C
Thayer's Gull		x	x	x	x	x	x	x		x	C	-	C	C
California Gull		x	x	x	x	x	x	x		x	C	C	C	C
Ring-billed Gull			x	x		x				x	C	U	C	U
Mew Gull		x	x	x	x	x	x	x		x	C	U	C	C
Bonaparte's Gull			x	x		x				x	C	C	C	U
Heermann's Gull		x	x			x	x	x		x	-	C	C	U
Black-legged Kittiwake		x	x					x		x	C	C	C	C
Common Tern			x			x				x	C	-	C	-
Caspian Tern	(N)		x			x				x	C	C	C	-

TABLE 1 (CONTINUED)

GEOGRAPHICAL TYPE USED (See Description)

Species	Ocean Waters	Major Entrance Channels	Ocean Beaches Sandy	Ocean Beaches Rocky	Channels, Submerged Reefs, etc.	Islands Rocky	Islands Sandy	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Sandy Spits	Ocean Jetties	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Columbia River Islands	Protected Harbors etc.
Pomarine Jaeger	x	x															
Parasitic Jaeger	x	xx	x		x					x				x			
Glaucous-winged Gull (N)	xx	xx	xx	x	xx	xx	x	x	x	x		x	xx	x	x	x	x
Western Gull (N)	xx	xx	xx	x	x	xx	x	x	x			x	xx	x	x		
Herring Gull	xx	x	x	x	x	x	x	x	x			x	x	x	x		
Thayer's Gull		x	x		xx	x	x	x	x	x		x	x	x	x		x
California Gull	xx	xx	xx	x	x	x	x	x	x	x		x	xx	x	x	x	x
Ring-billed Gull			x		x		x	x	x	x		x		x		x	x
Mew Gull			x		xx	x	x	x	x	x		x	x	x	x	x	x
Bonaparte's Gull	x	x	x		xx	x	x	x	x	x		x		x	x	x	x
Heermann's Gull	x	xx	xx	x	xx	x	x	x	x			x	xx	x	x		
Black-legged Kittiwake	xx	xx	x	x	x	x	x		x			x	xx				
Common Tern	x	x	x		x		x	x	x	x		x		x		x	
Caspian Tern (N)		x	x				x	x	x	x		x		x			

TABLE 1 (CONTINUED)

CRITICAL AREAS FROM T. R. WAHL

Species	Designated by No. on Maps	Comments
Pomarine Jaeger		
Parasitic Jaeger		
Glaucous-winged Gull		Nests essentially from Destruction Island north and east (intergrades with Western Gull).
Western Gull		Infrequent in Puget Sound, nests from Destruction Island south.
Herring Gull		
Thayer's Gull		More numerous than Herring Gull in inside waters (winter).
California Gull		Abundant migrant in fall, some present all year.
Ring-billed Gull		
Mew Gull		Very common in Puget Sound in winter.
Bonaparte's Gull		Not usually found beyond littoral zone offshore.
Heermann's Gull		Confined to littoral, not found farther offshore.
Black-legged Kittiwake		Non-breeders in variable numbers along coast in summer.
Common Tern		Common migrant.
Caspian Tern		Nests 5h, 7; widespread post-breeding dispersal.

TABLE 1 (CONTINUED)

PRIMARY HABITATS (D.O.E.)

Species		Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water	Seasonal Occurrence SP	SU	F	W
Common Murre	(N)	x								x	C	C	C	C
Pigeon Guillemot	(N)	x								x	C	C	C	C
Marbled Murrelet	(N?)									x	C	C	C	C
Ancient Murrelet	(N)	x								x	C	C	C	C
Cassin's Auklet	(N)	x								x	C	C	C	U
Rhinoceros Auklet	(N)	x								x	C	C	C	U
Tufted Puffin	(N)	x								x	C	C	C	R
Belted Kingfisher	(N)									x	C	C	C	C
Crow (sp.)	(N)	x	x	x	x	x					C	C	C	C
Snowy Owl			x						x					U
Snow Bunting			x			x					U		U	U

TABLE 1 (CONTINUED)

GEOGRAPHICAL TYPE USED (See Description)

Species	Ocean Waters	Major Entrance Channels	Ocean Beaches Sandy	Ocean Beaches Rocky	Channels, Submerged Reefs, etc.	Islands Rocky	Islands Sandy	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Sandy Spits	Ocean Jetties	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Columbia River Islands	Protected Harbors etc.
Common Murre (N)	xx	xx			xx	xx											x
Pigeon Guillemot (N)		x			x	xx						x	x				x
Marbled Murrelet (N?)		x			x					x							x
Ancient Murrelet (N)	x	x			x	x											
Cassin's Auklet (N)	x					xx											
Rhinoceros Auklet(N)	x	xx			xx	xx				x							
Tufted Puffin (N)	x	x			x	xx											
Belted Kingfisher (N)					x	x		x	x	x				x	x	x	x
Crow (sp.) (N)			x	x		x	x	x	x	x		x		x	x	x	
Snowy Owl			x				x			x	x	x		x			
Snow Bunting			x				x					x		x			

TABLE 1 (CONTINUED)

CRITICAL AREAS FROM T. R. WAHL

Species	Designated by No. on Maps	Comments
Common Murre	13, 14, 16, 17, 22, 23, 26; Many locations in winter	Disperses over Continental Shelf and into Puget Sound in winter.
Pigeon Guillemot		Nests in crevices, under logs on beaches, often close to human activity.
Marbled Murrelet		Nesting unknown in Washington.
Ancient Murrelet	22, 23 (?)	Common only locally, winters coastally and locally in Puget Sound in winter.
Cassin's Auklet	14, 16, 17, 22, 23, 26	Nests on islands off coast, forages in winter over Continental Shelf.
Rhinoceros Auklet		Nests Protection, Destruction, Smith Islands - winters over Continental Shelf south to California.
Tufted Puffin		Very few east of Protection Island, feeds over Continental Shelf, open ocean in winter.
Belted Kingfisher		
Crow (sp.)		
Snowy Owl		Cyclical.
Snow Bunting		Present regularly in small flocks, 8 to 100, in study area in winter.

TABLE 2 - BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

Seasonal Occurrence

SP - Spring migration, April-May

SU - Summer visitor, June

F - Fall migrant, July-November

W - Winter visitor, December-March

Rating

x to xxxx - Subjective judgment of value of an area or feature on a state-wide basis. Not quantitatively comparable area to area [e.g., Leadbetter Point/Willapa Bay complex (xxxx) is more than four times as valuable as a one check (x) location]. Rating dependent in part on amount of similar habitats available, how intensive the habitat is used and how unique is the habitat area.

xx or higher areas were coded on the associated maps as No. , with the number in the triangle corresponding to the far left column number in this table. These are critical areas for multiple species of birds.

Primary Habitats

Habitat categories of Department of Ecology that are available for bird usage:

x - habitat types available

xx - primary habitat types utilized.

Geographical Habitat Types

Geographical habitat types available for bird usage:

x to xxxx - geographical types rated as to extent or significance.

See description of geographical habitat types in key to Table 1.

Uses of Habitat Areas

N - Nesting

F - Feeding

R - Resting.

TABLE 2

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
WAHKIAKUM														
1. Columbia River Islands, Puget, N & S Hunting, Smaller Islands	—		—		xx		x	x	x	x			brackish	x
2. Grays Bay	—		—		x		x	x	?	?				x
PACIFIC														
3. Cape Disappointment, Peacock Spit, Jetty, North Head, Col. Riv. Channel	—		—		xxx	x	x	x		x				x
4. Ocean Beach, Seaview to Leadbetter Pt.	—		—		x		x			x		x		x
5. Willapa Bay - AS A UNIT, PROBABLY MOST IMPORTANT IN STATE														
a. Leadbetter Pt. South to include approx. Section 2, incl. Grassy and other islands, shoals, dunes, marsh, flats and channel	—		—		xxxx		x	x		x	x		x	x
b. Tidelands, West side of Willapa Bay (as at Nahcotta)	—		—		xx			x	x	x	x			x
c. Naselle Estuary, Long Island area	—		—		xx			x		x	x		x	x
d. Palix River Estuary, Marsh	—		—		xx			x		x	x		x	x
e. Willapa River, Channel	—		—		x			x		x			x	x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
WAHKIAKUM													
1. Columbia River Islands, Puget, N & S Hunting, Smaller Islands	x						Brackish						
2. Grays Bay				x			?				x		
PACIFIC													
3. Cape Disappointment, Peacock Spit, Jetty, North Head, Col. Riv. Channel		x	x			Edge				xxx			
4. Ocean Beach, Seaview to Leadbetter Pt.		x											
5. Willapa Bay - AS A UNIT, PROBABLY MOST IMPORTANT IN STATE													
a. Leadbetter Pt. South to include approx. Section 2, incl. Grassy and other islands, shoals, dunes, marsh, flats and channel		x		x		x	xxxx	x					x
b. Tidelands, West side of Willapa Bay (as at Nahcotta)				x								x	
c. Naselle Estuary, Long Island area						x	x						
d. Palix River Estuary, Marsh						x	xx						
e. Willapa River, Channel						x	x						

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
WAHKIAKUM								
1. Columbia River Islands, Puget, N & S Hunting, Smaller Islands					x	x	x	
2. Grays Bay		x				x	x	
PACIFIC								
3. Cape Disappointment, Peacock Spit, Jetty, North Head, Col. Riv. Channel	x			x		x	x	Especially significant feeding area - loons, shearwaters, cormorants, diving ducks, 'rock' shorebirds, gulls alcids.
4. Ocean Beach, Seaview to Leadbetter Pt.	x					x	x	
5. Willapa Bay - AS A UNIT, PROBABLY MOST IMPORTANT IN STATE								
a. Leadbetter Pt. South to include approx. Section 2, incl. Grassy and other islands, shoals, dunes, marsh, flats and channel	x	x			x	xx	xx	Especially for Red Knot, other shorebirds. Nesting snowy plovers, also for Brant, other geese and waterfowl in migration, winter. One of last large salt marshes, extensive tidal flats. Black-bellied plovers in large numbers.
b. Tidelands, West side of Willapa Bay (as at Nahcotta)						x		
c. Naselle Estuary, Long Island area					x	xx	x	
d. Palix River Estuary, Marsh						xx	x	
e. Willapa River, Channel								

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
f. Shoalwater Bay Flats to Toke Point					xxx			x		x	?		x	x
g. North Cove Flats					xx			x		x	?		x	x
h. Islands in N. center of Bay					xx			x		x			?	
6. Ocean Beach North to County Line					x		x			x		x		x
GRAYS HARBOR														
7. Grays Harbor - AS A UNIT, VERY IMPORTANT														
a. South Jetty, Groms to Pt. Chehalis, G.H. Channel, Pt. Brown Jetty area					xxx	x	x		x	x		x		x
b. Saltmarsh, East of Westport Air Strip					xx			x		x			x	
c. Elk River Estuary, Flats					xx			x		x	?		x	x
d. John's River					x			x		x			x	x
e. Chehalis River Estuary, Flats, South Channel Shore					x			x		x			x	x
f. Hoquiam Airport, Moon Island Flats, etc.					xx		x	x		x	?		x	x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
f. Shoalwater Bay Flats to Toke Point				x			xx						
g. North Cove Flats				x			xx						
h. Islands in N. center of Bay				x				x			x		
6. Ocean Beach North to County Line		x											
GRAYS HARBOR													
7. Grays Harbor - AS A UNIT, VERY IMPORTANT													
a. South Jetty, Groms to Pt. Chehalis, G.H. Channel, Pt. Brown Jetty area		x				edge				xxx	x		
b. Saltmarsh, East of Westport Air Strip				x			xx						
c. Elk River Estuary, Flats						x	x						
d. John's River						x	x						
e. Chehalis River Estuary, Flats, South Channel Shore						x	x						
f. Hoquiam Airport, Moon Island Flats, etc.				x			xx						x

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
f. Shoalwater Bay Flats to Toke Point						xx	x	Especially for Red Knot (large numbers occur only at a few places in State).
g. North Cove Flats						xx	x	Especially for Red Knot (large numbers occur only at a few places in State).
h. Islands in N. center of Bay					xx		x	Gulls, Caspian Terns nesting.
6. Ocean Beach North to County Line	x					x	x	
GRAYS HARBOR								
7. Grays Harbor - AS A UNIT, VERY IMPORTANT								
a. South Jetty, Groms to Pt. Chehalis, G.H. Channel, Pt. Brown Jetty area	x		x	x		xx	x	Pigeon Guillemots nest in jetty crevices. Especially important feeding area. Rock-associated species (feeding and roosting) are dependent on jetties between Pt. Grenville area and Tillamook. Important Feeding area for Rhinoceros Auklets. (See 17).
b. Saltmarsh, East of Westport Air Strip						xx	x	
c. Elk River Estuary, Flats					x	xx	x	
d. John's River					x	x	x	Especially herons, water fowl, shorebirds (including Red Knot).
e. Chehalis River Estuary, Flats, South Channel Shore						x	x	
f. Hoquiam Airport, Moon Island Flats, etc.						xx	x	Important especially for Red Knots, Marbled Godwits, large numbers of gulls.

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
g. North Bay Flats					xx		x	x		x	?		x	x
h. Pt. Damon Spit, Flats					xx		x	x		x	?		x	x
i. Islands in Bay, Whitcomb Flats, Sand, Goose, etc.					xxx		x	x		x			?	
j. Oyhut Saltmarsh (WRA)					xxx			x					x	
8. Ocean Beach, Pt. Brown to approximately Moclips					x		x			x		x		x
9. Copalis River Estuary					x		x	x	x	x				x
10. Moclips River Estuary					x		x	x	x	x				x
11. Quinault River Estuary					x		x	x	x	x				x
12. Raft River Estuary					x		x	x	x	x				x
13. Ocean Shoreline, Incl. Pt. Grenville Area, etc.					xx	x						x		x
14. Offshore rocks, incl. Copalis NWR					xxx	x						x		x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
g. North Bay Flats				x			xx						
h. Pt. Damon Spit, Flats				x			xx						x
i. Islands in Bay, Whitcomb Flats, Sand, Goose, etc.				x				x			x		
j. Oyhut Saltmarsh (WRA)				x			xxx				x		x
8. Ocean Beach, Pt. Brown to approximately Moclips		x											
9. Copalis River Estuary					x								x
10. Moclips River Estuary					x								x
11. Quinault River Estuary					x								x
12. Raft River Estuary					x								x
13. Ocean Shoreline, Incl. Pt. Grenville Area, etc.			x										
14. Offshore rocks, incl. Copalis NWR									x				

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
g. North Bay Flats						x	x	Important especially for Red Knots, Marbled Godwits, large numbers of gulls.
h. Pt. Damon Spit, Flats					x	x	x	Snowy Plovers nest.
i. Islands in Bay, Whitcomb Flats, Sand, Goose, etc.					xx		x	Gulls, Caspian Terns nest.
j. Oyhut Saltmarsh (WRA)						xx	x	
8. Ocean Beach, Pt. Brown to approximately Moclips						x	x	
9. Copalis River Estuary						x	x	Small estuaries of this type important for bathing, feeding, resting areas, especially for gulls, shorebirds, cormorants.
10. Moclips River Estuary						x	x	
11. Quinault River Estuary						x	x	
12. Raft River Estuary						x	x	
13. Ocean Shoreline, Incl. Pt. Grenville Area, etc.	x					x	x	
14. Offshore rocks, incl. Copalis NWR	x				xx	x	x	Nesting storm petrels, cormorants, oyster-catcher, gulls, alcids.

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
						PRIMARY HABITATS (D.O.E.)								
JEFFERSON - WEST														
15. Queets River Estuary					x			x	x	x	x			x
16. Offshore Rocks, Reefs, (Quillayute Needles NWR)					xxx	x						x		x
17. Destruction Island					xxx	x						x		x
18. Hoh River Estuary					x		x	x	x	x				x
19. Ocean Beach					x	x			x			x		x
CLALLAM														
20. Ocean Beach (as 19)														
21. Quillayute River Estuary					x		x	x	x	x				x
22. Offshore Islands, Quillayute Needles NWR					xxx	x						x		x
23. Offshore Islands, Flattery Rocks NWR					xxx	x						x		x
24. Ozette River Estuary					x		x	x	x	x				x
25. Waatch River, Sooes River, Mukkaw Bay Estuary					xx		x	x		x			x	x
26. Tatoosh Island					xxx	x						x		x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
JEFFERSON - WEST													
15. Queets River Estuary					x								x
16. Offshore Rocks, Reefs, (Quillayute Needles NWR)									x				
17. Destruction Island									x				
18. Hoh River Estuary					x								x
19. Ocean Beach			x										
CLALLAM													
20. Ocean Beach (as 19)													
21. Quillayute River Estuary					x								x
22. Offshore Islands, Quillayute Needles NWR									x				
23. Offshore Islands, Flattery Rocks NWR									x				
24. Ozette River Estuary					x								x
25. Waatch River, Sooes River, Mukkaw Bay Estuary						x	xx				x		x
26. Tatoosh Island									x				

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
JEFFERSON - WEST								
15. Queets River Estuary						x	x	
16. Offshore Rocks, Reefs, (Quillayute Needles NWR)	x				xx	x	x	As 14 above.
17. Destruction Island	x				xx	x	x	Large numbers of nesting sp. (as 14) concentrated; especially 5,000 pair Rhinoceros Auklets.
18. Hoh River Estuary						x	x	
19. Ocean Beach	x					x	x	
CLALLAM								
20. Ocean Beach (as 19)								
21. Quillayute River Estuary			x			x	x	
22. Offshore Islands, Quillayute Needles NWR	x				xx	x	x	Nesting storm petrels, cormorants, oyster-catchers, gulls, alcids; feeding - rock shore-birds, many gulls.
23. Offshore Islands, Flattery Rocks NWR	x				xx	x	x	
24. Ozette River Estuary						x	x	
25. Waatch River, Sooes River, Mukkaw Bay Estuary						x	x	
26. Tatoosh Island					xx	x	x	Same as above

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
27. Rocks on Strait of Juan de Fuca					x	x						x		
28. Shoreline on Straits					x	x	x	x	x	x	x	x		x
29. Pysht River Estuary					x		x	x		x				x
30. Elwha River Estuary					x		x	x		x				x
31. Ediz Hook, Port Angeles Harbor					xx		x	x		x	?			x
32. Dungeness Spit, Bay					xxxx		x	x		x	x		x	x
33. Sequim Bay, Spit					xxx		x	x		x	x	x		x
JEFFERSON - EAST														
34. Protection Island														
a. Uplands, Cliffs - Slopes, Sandstone Cliffs					xxxx				x	x		x		x
b. Violet Point Spit					xxx					x		x		x
35. Discovery Bay					xxx		x	x		x	x	x		x
36. Admiralty Inlet, Adjacent Areas					xxx							x		x
Hood Canal														

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
27. Rocks on Strait of Juan de Fuca									x				
28. Shoreline on Straits				x					x		x	x	
29. Pysht River Estuary					x								x
30. Elwha River Estuary					x								x
31. Ediz Hook, Port Angeles Harbor				x	x								x
32. Dungeness Spit,Bay				x	x		xx						x
33. Sequim Bay, Spit				x			x						x
JEFFERSON - EAST													
34. Protection Island													
a. Uplands, Cliffs - Slopes, Sandstone Cliffs				x					(x)		x	x	
b. Violet Point Spit				x								x	x
35. Discovery Bay				x	x								x
36. Admiralty Inlet, Adjacent Areas										xx			
Hood Canal													

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
27. Rocks on Strait of Juan de Fuca					?	x	x	
28. Shoreline on Straits			x			x	x	Total extent of habitat important.
29. Pysht River Estuary						x	x	
30. Elwha River Estuary						x	x	
31. Ediz Hook, Port Angeles Harbor			x			x	x	
32. Dungeness Spit, Bay			x		x	xx	x	Important feeding area all seasons, especially Brant, Rhinoceros Auklets (from 34), winter waterfowl. Canada Geese nest (?).
33. Sequim Bay, Spit			x			xx	x	
JEFFERSON - EAST								
34. Protection Island								
a. Uplands, Cliffs - Slopes, Sandstone Cliffs		x			xx	x	x	Especially 12,000 pairs Rhinoceros Auklets, *Cormorants*, *Pigeon Guillemots*, *Tufted Puffins*. Largest Rhino. colony south of Alaska. 3,000 pairs glaucous-winged gulls nest, largest single colony in inside waters; feeding area for Rhinos (34), large numbers winter water fowl, gulls, cormorants.
b. Violet Point Spit					xx	x	x	
35. Discovery Bay			x			xx	x	
36. Admiralty Inlet, Adjacent Areas						xx	x	
Hood Canal								

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
						PRIMARY HABITATS (D.O.E.)								
37. Bywater Bay					xx		x	x		x			x	x
38. Suquamish Harbor					x			x						x
39. Thorndike Bay					xx			x					x	x
40. Dabob Bay - Tarboo Bay - Long Spit					xx		x	x		x			x	x
41. Big Quilcene Estuary, Quilcene Bay					x		x	x		x			x	x
42. Dosewallips River Estuary					x		x	x		x			x	x
43. Duckabush River Estuary					x		x	x		x			x	x
KITSAP														
44. Twin Spits					x		x	x		x			x	
45. Port Gamble Bay					x		x	x		x				x
46. Shorelines - Seabeck Area, Area SW of Tekiu Point					x						?	?		x
47. Port Madison - Miller Bay, Port Miller Subtidal Area					x		x	x		x	?		?	x
48. Shorelines - Tidelands, e.g., Eagle Harbor, Poulsbo, Burley Lagoon					x		xx				?			x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
37. Bywater Bay				x			x						x
38. Suquamish Harbor				x									
39. Thorndike Bay				x			x						x
40. Dabob Bay - Tarboo Bay - Long Spit				x			x						x
41. Big Quilcene Estuary, Quilcene Bay					x								
42. Dosewallips River Estuary					x								
43. Duckabush River Estuary					x								
KITSAP													
44. Twin Spits				x									x
45. Port Gamble Bay				x									
46. Shorelines - Seabeck Area, Area SW of Tekiu Point													
47. Port Madison - Miller Bay, Port Miller Subtidal Area				x									x
48. Shorelines - Tidelands, e.g., Eagle Harbor, Poulsbo, Burley Lagoon				x							x	x	

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
37. Bywater Bay			x			x	x	
38. Suquamish Harbor			x			x	x	
39. Thorndike Bay			x			x	x	
40. Dabob Bay - Tarboo Bay - Long Spit			x			x	x	
41. Big Quilcene Estuary, Quilcene Bay			x			x	x	
42. Dosewallips River Estuary						x	x	
43. Duckabush River Estuary						x	x	
KITSAP								
44. Twin Spits			x			x	x	
45. Port Gamble Bay			x			x	x	
46. Shorelines - Seabeck Area, Area SW of Tekiu Point		x	(x)			x	x	Depends on amount and quality of habitat remaining and extent of conflicting uses (as log storage).
47. Port Madison - Miller Bay, Port Miller Subtidal Area			x			x	x	
48. Shorelines - Tidelands, e.g., Eagle Harbor, Poulsbo, Burley Lagoon			x			x	x	

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
MASON														
49. Hamma Hamma River Estuary					xx		x	x		x	?		?	x
50. Lilliwaup Bay					x									
51. Anna Bay - Skokomish Estuary					x									
52. Tahuya River Estuary					x									
53. Lynch Cove, Union River Estuary					xx									
54. Dewatto Estuary					x									
THURSTON														
55. Eld Inlet					xx		x	x					x	x
56. Budd Inlet					x									
57. Totten Inlet					x									
58. Henderson Inlet					x									
59. Undeveloped Shorelines					x									
60. Nisqually Delta, Estuary					xxxx		x	x					x	x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
MASON													
49. Hamma Hamma River Estuary				x	x		x						
50. Lilliwaup Bay													
51. Anna Bay - Skokomish Estuary					x		x						
52. Tahuya River Estuary					x								
53. Lynch Cove, Union River Estuary					x		x						
54. Dewatto Estuary					x								
THURSTON													
55. Eld Inlet				x	x		x						
56. Budd Inlet													
57. Totten Inlet													
58. Henderson Inlet													
59. Undeveloped Shorelines													
60. Nisqually Delta, Estuary				x		x	xx						

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
MASON								
49. Hamma Hamma River Estuary						x	x	
50. Lilliwaup Bay			x					
51. Anna Bay - Skokomish Estuary								
52. Tahuya River Estuary			x					
53. Lynch Cove, Union River Estuary								
54. Dewatto Estuary								
THURSTON								
55. Eld Inlet			x			x	x	
56. Budd Inlet			x					
57. Totten Inlet			x					
58. Henderson Inlet			x					
59. Undeveloped Shorelines			x					
60. Nisqually Delta, Estuary					x	xx	x	Important as only area of its type of any extensive size within great distance. Great variety, large numbers of many species.

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
PIERCE														
60. (as above)														
61. Tidal Channels (also for KING)					x							x		x
62. Shoreline, Inlets					x	x	x	x	x	x	?	x		x
KING														
63. Shorelines					x							x		x
64. Vashon, Maury Island, Bays, Shorelines					x	x	x	x	x	x	?	x		x
SNOHOMISH														
65. Snohomish River Delta, Estuary, including Ebey Slough					xxx		x	x		x			x	x
66. Tulalip Bay					x			x						x
67. Stillaguamish Estuary					xx		x			x			x	x
68. Skagit River Delta, Estuary					xxxx		x	x		x	x		x	x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
PIERCE													
60. (as above)													
61. Tidal Channels (also for KING)													
62. Shoreline, Inlets											x	x	
KING													
63. Shorelines											x	x	
64. Vashon, Maury Island, Bays, Shorelines											x	x	
SNOHOMISH													
65. Snohomish River Delta, Estuary, including Ebey Slough				x		x	x						
66. Tulalip Bay				x									x
67. Stillaguamish Estuary				x		x	x						
68. Skagit River Delta, Estuary				xxx		x	xx						

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
PIERCE								
60. (as above)								
61. Tidal Channels (also for KING)		x				x	x	
62. Shoreline, Inlets			x			x	x	
KING								
63. Shorelines			x			x	x	
64. Vashon, Maury Island, Bays, Shorelines		x	x			x	x	
SNOHOMISH								
65. Snohomish River Delta, Estuary, including Ebey Slough						x	x	
66. Tulalip Bay			x			x	x	
67. Stillaguamish Estuary						x	x	
68. Skagit River Delta, Estuary						x	x	Single most important estuary in North Puget Sound: Snow Geese, Black Brant, Whistling Swans, Eagles, especially in winter.

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
ISLAND														
69. Cultus Bay					x			x					x	x
70. Deer Lagoon					xx			x					x	x
71. Crockett's Lake					xxx			x					x	x
72. Ebey's Landing					x			x					x	
73. Penn Cove, Kennedy Lagoon					xxx		x	x	x	x	x	x	x	x
74. Sunset Beach Saltmarsh					x			x					x	
75. Deception Pass Area					xxx	x	x		x	x		x		x
76. Ala Spit					x		x	x						
77. Dugulla Bay, Slough					xx			x					x	x
78. Smith Island, Minor Island - Bluffs, Slope					xxx		x		x	x		x		x
36. Admiralty Inlet														
79. Saratoga Passage Tidelands					x			x						x
80. Camano Island, Triangle Cove, Livingston Bay, Elgar Bay					x			x						x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
ISLAND													
69. Cultus Bay				x			x						x
70. Deer Lagoon				x			x						x
71. Crockett's Lake				x			x						
72. Ebey's Landing							x						x
73. Penn Cove, Kennedy Lagoon				x			x					x	x
74. Sunset Beach Saltmarsh							x						
75. Deception Pass Area									x			x	x
76. Ala Spit				x			x						x
77. Dugulla Bay, Slough				x	x		x						
78. Smith Island, Minor Island - Bluffs, Slope									x				x
36. Admiralty Inlet													
79. Saratoga Passage Tidelands				x							x		
80. Camano Island, Triangle Cove, Livingston Bay, Elgar Bay				x			x						x

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
ISLAND								
69. Cultus Bay			x			x	x	
70. Deer Lagoon			x			x	x	
71. Crockett's Lake			x			xx	x	
72. Ebey's Landing			x			x	x	
73. Penn Cove, Kennedy Lagoon			x			xx	x	Especially important for 'rock' shorebirds, and for scoters and other diving birds all year.
74. Sunset Beach Saltmarsh						x		
75. Deception Pass Area		xx				xx	x	Especially important feeding area for cormorants, alcids, (including Rhinoceros Auklets), diving ducks, Arctic Loons.
76. Ala Spit			x			x	x	
77. Dugulla Bay, Slough			x			x	x	
78. Smith Island, Minor Island - Bluffs, Slope					xx	x	x	Rhinoceros Auklets (600+ pairs) nesting and other species, gulls.
36. Admiralty Inlet								
79. Saratoga Passage Tidelands			x			x	x	
80. Camano Island, Triangle Cove, Livingston Bay, Elgar Bay			x			x	x	

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
						PRIMARY HABITATS (D.O.E.)								
81. Shorelines					x		x	x	x	x				x
68. Skagit Bay														
SKAGIT														
68. Skagit River Delta, Estuary (including Skagit WRA)														
82. Similk Bay					x		x	x			?		x	x
75. Deception Pass Area														
83. Guemes Channel					xxx							x		x
84. Fidalgo Bay					xx			x			x		x	x
85. Padilla Bay					xxxx		x	xx		x	xx		x	x
86. Samish Bay					xxx		x	xx		x	xx	x	x	x
87. Williamson Rocks					xx	x						x		x
88. Reefs, etc.					x							x		x
89. Tidal Channels between Islands, etc.					x									x
90. Shorelines: Mainland, Guemes, Cypress, Other Islands					x		x	x		x	x	x		x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
81. Shorelines				x							x	x	
68. Skagit Bay													
SKAGIT													
68. Skagit River Delta, Estuary (including Skagit WRA)													
82. Similk Bay				x			x				x		x
75. Deception Pass Area													
83. Guemes Channel													
84. Fidalgo Bay				x	x		x				x	x	x
85. Padilla Bay				xxx	x		x				x	x	x
86. Samish Bay				xx	x		x				x	x	x
87. Williamson Rocks									x				
88. Reefs, etc.													
89. Tidal Channels between Islands, etc.													
90. Shorelines: Mainland, Guemes, Cypress, Other Islands								x	x		x	x	

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
81. Shorelines								
68. Skagit Bay								
SKAGIT								
68. Skagit River Delta, Estuary (including Skagit WRA)								
82. Similk Bay			x			x	x	
75. Deception Pass Area		x				xx		Important winter feeding area - cormorants, diving ducks, gulls, alcids (large numbers, especially murres, also marbled and ancient murrelets, Rhinoceros Auklets).
83. Guemes Channel		x				xx		
84. Fidalgo Bay			x			x	x	
85. Padilla Bay			x			xx	xx	Waterfowl in large numbers in winter, especially Black Brant, herons (600-700 pairs glaucous-winged gulls nest at north end of Swinomish Slough).
86. Samish Bay			x			xx	xx	
87. Williamson Rocks		x			xx	x	x	Nesting cormorants, oystercatchers, guillemots, gulls.
88. Reefs, etc.		x				xx		
89. Tidal Channels between Islands, etc.		x				xx	x	
90. Shorelines: Mainland, Guemes, Cypress, Other Islands		x						

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
SAN JUAN														
91. Rocks, uninhabited islands including those within SJI NWR and Wilderness Area Proposal, also incl. Patos, Sucia, Matia, Clark and Barnes					xxxx	x	x					x		x
92. Bays, Tidal Flats, Marshes (list below but not necessarily complete)*					xxx		x	x		x	x	x	x	x
93. South End San Juan Channel (Goose Island area)														
94. Thatcher Pass														
95. Harney Channel														
96. Wasp Pass					xxx							x		x
97. Speiden Channel														
98. Obstruction/Peavine Pass														
99. Shorelines					xx	x	x		x		x	x		x

*San Juan: False Bay, Cattle Point Tidal Area;
Orcas: Deer Harbor, East Sound, West Sound;
Lopez: Fisherman Bay, Mackaye Harbor/Barlow Bay, Aleck Bay Area, Mud Bay, Spencer Spit, Watmough Bay;
Shaw: Blind Bay, etc.

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
SAN JUAN													
91. Rocks - uninhabited islands including those within SJI NWR and Wilderness Area Proposal, also incl. Patos, Sucia, Matia, Clark and Barnes									x			x	
92. Bays, Tidal Flats, Marshes (list below but not necessarily complete)*				x	x		x	x	x				x
93. South End San Juan Channel (Goose Island area)													
94. Thatcher Pass													
95. Harney Channel													
96. Wasp Pass													
97. Speiden Channel													
98. Obstruction/Peavine Pass													
99. Shorelines									x		x	x	

*San Juan: False Bay, Cattle Point Tidal Area;
Orcas: Deer Harbor, East Sound, West Sound;
Lopez: Fisherman Bay, Mackaye Harbor/Barlow Bay, Aleck Bay Area, Mud Bay, Spencer Spit, Watmough Bay;
Shaw: Blind Bay, etc.

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
SAN JUAN								
91. Rocks, uninhabited islands including those within SJI NWR and Wilderness Area Proposal, also incl. Patos, Sucia, Matia, Clark and Barnes		x	x		xx	xx	x	Nesting cormorants, oystercatchers, guillemots, gulls.
92. Bays, Tidal Flats, Marshes (list below but not necessarily complete)*		x	x			x	x	Important feeding areas: cormorants, Arctic Loons, gulls, diving ducks.
93. South End San Juan Channel (Goose Island area)								As above.
94. Thatcher Pass								As above.
95. Harney Channel								As above.
96. Wasp Pass		x				xx	x	As above.
97. Speiden Channel								As above.
98. Obstruction/Peavine Pass								As above.
99. Shorelines			x			xx	x	

*San Juan: False Bay, Cattle Point Tidal Area;
Orcas: Deer Harbor, East Sound, West Sound;
Lopez: Fisherman Bay, Mackaye Harbor/Barlow Bay, Aleck Bay Area, Mud Bay, Spencer Spit, Watmough Bay;
Shaw: Blind Bay, etc.

TABLE 2 (CONTINUED)

BIRD SPECIES HABITAT AREAS BY COASTAL COUNTIES

SITE OR AREA	Season SP	SU	F	W	Rating	PRIMARY HABITATS (D.O.E.) Rock	Sand	Mud	Mixed Coarse	Mixed Fine	Eel Grass	Kelp	Salt Marsh	Open Water
WHATCOM														
100. Chuckanut Bay, Shorelines to Bellingham					xx	x						x		x
101. Nooksack Delta					xxx		x	x		x	x		x	x
102. Bellingham Bay					xxx			x			x			x
103. Portage Bay					x		x	x		x	x			x
104. Hales Pass					xx							x		x
105. Lummi Bay					xxx			x		x	x		x	x
106. Birch Bay					xx		x			x	x			x
107. Drayton Harbor, Flats North to Border					xxx		x	x		x	x			x
108. Pt. Roberts: SW Point, Feeding Areas					xxx									x
109. Rocks: Viti, Eliza, Lummi, Migley, Chuckanut Bay and South					xx	x						x		x
110. Shorelines: Lummi and Portage (Point Francis) Islands					x	x	x	x	x	x	x	x		x

TABLE 2 (CONTINUED)

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Columbia River Islands	Ocean Beaches Sandy	Ocean Beaches Rocky	Tidal Flats	Estuaries Small	Estuaries Large	Salt Marsh	Islands Sandy	Islands Rocky	Major Entrance Channels	Undeveloped Beaches Sandy	Undeveloped Beaches Rocky	Sandy Spits
WHATCOM													
100. Chuckanut Bay, Shorelines to Bellingham									x			x	
101. Nooksack Delta				x		x	x	x			x		
102. Bellingham Bay											x		
103. Portage Bay				x							x		x
104. Hales Pass											x		x
105. Lummi Bay				x			x				x		x
106. Birch Bay				x	x						x		x
107. Drayton Harbor, Flats North to Border				x	x						x		x
108. Pt. Roberts: SW Point, Feeding Areas												x	x
109. Rocks: Viti, Eliza, Lummi, Migley, Chuckanut Bay and South									x				
110. Shorelines: Lummi and Portage (Point Francis) Islands				x							x	x	x

TABLE 2 (CONTINUED

BIRD HABITATS (T. R. WAHL)

SITE OR AREA	Ocean Waters	Channels Submerged Reefs, etc.	Protected Harbors	Jetties	Uses: N	F	R	Comments
WHATCOM								
100. Chuckanut Bay, Shorelines to Bellingham			x			xx	x	
101. Nooksack Delta						xx	x	Whistling swans, large numbers winter ducks; shorebirds and terns in migration, gulls all year.
102. Bellingham Bay			x			xx	xx	Especially grebes, loons, cormorants, diving ducks, alcids, gulls in winter.
103. Portage Bay			x			x	x	As adjunct to Bellingham Bay and Hale's Passage.
104. Hales Pass		x	x			xx	x	Same as above.
105. Lummi Bay			x			xx	x	As above. Especially also shorebirds, Black Brant.
106. Birch Bay			x			x	x	As 105, including Black Brant.
107. Drayton Harbor, Flats North to Border		x	x			xx	x	As 105, including Black Brant.
108. Pt. Roberts: SW Point, Feeding Areas		x				xx	x	As 105, including Black Brant. Very significant feeding areas.
109. Rocks: Viti, Eliza, Lummi, Migley, Chuckanut Bay and South		x			x	x	x	Nesting gulls, etc., on Viti Rock.
110. Shorelines: Lummi and Portage (Point Francis) Islands			x			xx	x	

TABLE 3

BIRD DATA GAP MATRIX

Species	No. of Critical Areas	Systematic Censusing	Breeding Censusing	Feeding Area Determination	Flocking Area Determination	Ecological Studies of Breeding Feeding	Habit Determination
Common Loon	-	x		x			
Arctic Loon	-	x		x			
Red-throated Loon	-	x		x			
Red-necked Grebe	-	x		x	x		
Horned Grebe	-	x		x	x		
Eared Grebe	-	x		x	x		
Western Grebe	4	x		x			
Double-crested Cormorant	9						
Brandt's Cormorant	4		x	x		x	
Pelagic Cormorant	18		x	x			
Whistling Swan	3	x		x			
Western Canada Goose	3	x				x	
Black Brant	5					x	
White-fronted Goose	-	x		x			

TABLE 3 (CONTINUED)

BIRD DATA GAP MATRIX

Species	No. of Critical Areas	Systematic Censusing	Breeding Censusing	Feeding Area Determination	Flocking Area Determination	Ecological Studies of Breeding Feeding	Habit Determination
ıow Goose	2			x			x
,allard	7	x					
Pintail	7	x					
Green-winged Teal	-	x					
American Wigeon	7	x					
Northern Shoveler	-	x					
Canvasback	6	x					x
Greater Scaup	2	x		x			
Lesser Scaup	-	x		x			
Common Goldeneye	-	x		x			
Barrow's Goldeneye	-	x		x			
Bufflehead	-	x		x			
Old Squaw	-	x					x
Harlequin Duck	-		x			x	

TABLE 3 (CONTINUED)

BIRD DATA GAP MATRIX

Species	No. of Critical Areas	Systematic Censusing	Breeding Censusing	Feeding Area Determination	Flocking Area Determination	Ecological Studies of Breeding Feeding	Habitat Determination
White-winged Scoter	-		x				
Surf Scoter	-	x		x			
Black Scoter	-	x					
Common Merganser	-	x					
Red-breasted Merganser	-	x					
American Coot	-	x					
Parasitic Jaeger	-	x					
Glaucous-winged Gull	28		x			x	
Western Gull	7		x			x	
Herring Gull	-	x					
California Gull	-	x					
Ring-billed Gull	-	x					
Mew Gull	-	x					
Bonaparte's Gull	-	x					
Hermann's Gull	-	x					

TABLE 3 (CONTINUED)

BIRD DATA GAP MATRIX

Species	No. of Critical Areas	Systematic Censusing	Breeding Censusing	Feeding Area Determination	Flocking Area Determination	Ecological Studies of Breeding Feeding	Habitat Determination
Thayer's Gull	-	x					
Common Tern	-	x				x	
Common Murre	10	x				x	
Pigeon Guillemot	-	x		x			
Marbled Murrelet	-	x				x	
Cassin's Auklet	4		x				
Rhinoceros Auklet	3	x	x				
Tufted Puffin	11		x	x			
Wilson's Phalarope	-	x					
Northern Phalarope	-	x					
Great Blue Heron	8		x				
Whimbrel	-	x	x				
Spotted Sandpiper	-	x		x			
Wandering Tattler	-	x					

TABLE 3 (CONTINUED)

BIRD DATA GAP MATRIX

Species	No. of Critical Areas	Systematic Censusing	Breeding Censusing	Feeding Area Determination	Flocking Area Determination	Ecological Studies of Breeding Feeding	Habitat Determination
Greater Yellowlegs	-	x					
Lesser Yellowlegs	-	x					
Red Knot	7	x		x			
Pectoral Sandpiper	-	x					
Least Sandpiper	1	x		x			
Dunlin	5	x					x
Short-billed Dowitcher	-	x					
Long-billed Dowitcher	-	x					
Western Sandpiper	-	x					
Sanderling	-	x					
Black Oystercatcher	16		x				
Semi-palmated Plover	-	x					
Killdeer	-	See Fact Sheet					
Black-bellied Plover	1	x					

TABLE 3 (CONTINUED)

BIRD DATA GAP MATRIX

Species	No. of Critical Areas	Systematic Censusing	Breeding Censusing	Feeding Area Determination	Flocking Area Determination	Ecological Studies of Breeding Feeding	Habitat Determination
Surfbird	-	x					
Ruddy Turnstone	-	x					
Black Turnstone	-	x					
Belted Kingfisher	-	See Fact Sheet					
Northern Bald Eagle	Many	x	x				
Osprey	4	x	x				
Northwestern Crow	-	x					

BIRD VOLUME

NOTE TO THE USER

The users of these materials should have three additional sources available:

1. Beak Consultants, Inc., 1975, Biological Oil Impact Literature Review - Volume II, Bibliography. Prepared for Washington Department of Ecology.

2. Eaton, R. L., 1975. Marine Shoreline Fauna of Washington, A Status Survey. Washington Departments of Game and Ecology, Washington.

3. Salo, L. J., 1975, A Baseline Survey of Significant Marine Birds in Washington State. Washington Departments of Game and Ecology, Olympia, Washington.

FACT SHEET

B-1 COMMON LOON

Gavia immer

LIFE HISTORY - See WDG Report Salo 1975.

WASHINGTON DISTRIBUTION - Common winter visitor and migrant and uncommon non-breeding summer visitor in coastal and Puget Sound saltwater habitats. It is also an uncommon summer visitor and migrant in freshwater lakes of Washington (131, 132, Wahl and Paulson, 1973). It is usually seen in pairs or small flocks (132) although larger concentrations have been observed, e.g., 700 birds recorded at Willapa Bay National Wildlife Refuge in April (773). It is especially numerous in spring (March to May) on Puget Sound, Hood Canal, and Willapa Bay (131).

HABITAT REQUIREMENTS - Common loon resides in open water habitat where it feeds primarily on fish. Habitats utilized are ocean waters, major entrance channels and submerged reefs in protected or "inside" waters, water over tidal flats and protected harbors, small and large estuaries (Wahl, 1976).

CRITICAL HABITAT AREAS - Because of the common loon's wide distribution and abundance throughout the State's marine waters and the lack of specific large concentration areas, no specific sites have been mapped as critical. One must remember, however, that open water habitat throughout the coastal and estuarine areas must be protected to maintain the State's common loon

populations. In the case of the common loon, some of the more important general areas appear to be Willapa Bay, Hood Canal and Puget Sound.

DATA GAPS - Systematic censuses of wintering and migrating common loons need to be conducted throughout open water habitats of the State. Determination and mapping of major feeding areas is also needed.

REFERENCES - 131, 132, Salo 1975, Wahl, 1976, 773, Wahl and Paulson, 1973.

FACT SHEET

B-2 ARCTIC LOON

Gavia arctica

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common winter visitor and migrant in open water habitats of coast and Puget Sound. It is a very common spring migrant (May) offshore along ocean coast. Uncommon non-breeder on salt water in summer and rare fall migrant on freshwater lakes of Eastern Washington (Wahl and Paulson, 1973). Usually occur in small groups but during migration large concentrations are not uncommon, e.g., 420 birds at Westport in April (771), 100 at Deception Pass in November (901), a maximum of 1,000 observed in vicinity of Cypress Island from October to May (774).

HABITAT REQUIREMENTS - The arctic loon is primarily an inhabitant of open ocean waters, major entrance channels and, in particular, channels and submerged reefs in protected "inside" waters (Wahl, 1976). The loon feeds primarily on fish in these areas (Salo, 1975).

CRITICAL HABITAT AREAS - Due to the wide distribution of arctic loons no specific sites have been mapped as critical. The channels and submerged reefs in protected "inside waters" of the State are particularly important to arctic loon and one could map this entire habitat as important. Specific known important concentration areas mapped include the coastal waters of the

ocean coast from Seaview to Leadbetter Point, waters at the mouth of Grays Harbor, Deception Pass, waters off the southwest point of Point Roberts and the following channels and areas in the San Juan Islands: Guemes Channel, Wasp Pass, Speiden Channel, Obstruction to Peavine Pass (Wahl, 1976), waters on the west side of Cypress Island near Strawberry Bay, waters near Deer Harbor, Orcas Island (774), Harney Channel, southern end of San Juan Channel, and Thatcher Pass.

DATA GAPS - Need systematic censusing of migrating and wintering populations and mapping of major feeding areas, particularly in channels and reefs of "inside waters", e.g., San Juan Islands.

REFERENCES - Salo 1975, 131, Wahl 1976, 771, 901, 774 Wahl and Paulson 1973.

FACT SHEET

B-3 RED-THROATED LOON

Gavia stellata

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common winter visitor and migrant in open water habitat of coastal waters and Puget Sound. Occasionally occurring as a non-breeding summer visitor in saltwater habitats (131, Wahl and Paulson, 1973). The red-throated loon is usually seen alone or in small flocks (Salo, 1975). Larger concentrations are observed during peaks of migration as supported by observations of 50 in March at Ilwaco and Deception Pass (771), over 80 seen in May at Port Gamble (772), and over 100 recorded in vicinity of San Juan Island from October to May, over 100 sighted along Cypress Island from Strawberry Bay to Tokeland from October to May, and over 100 recorded near Deer Harbor, Orcas Island, from October to May (774).

HABITAT REQUIREMENTS - The red-throated loon inhabits ocean waters, waters of major entrance channels, channels and reefs of inside waters, water over tidal flats, small and large estuaries and protected harbors where it feeds on fish, molluscs and crustaceans (Wahl, 1976, 132).

CRITICAL HABITAT AREAS - Because of its widespread distribution and lack of large concentrations in any one area, no specific critical habitat sites have been mapped. Their continued occurrence in the open waters of Washington will depend on the protection given open water habitats.

REFERENCES - 131,132, Wahl and Paulson 1973, Salo 1975, Wahl 1976, 771, 772, 774.

FACT SHEET

B-4 RED-NECKED GREBE

Podiceps grisegena

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor (September to May) and rare non-breeding summer visitor on open salt waters of Puget Sound and along coast. It is also a migrant and winter visitor on inland lakes and an uncommon summer breeding resident in Eastern Washington (Wahl and Paulson, 1973, 131). In wintering areas red-necked grebes form small flocks of 10 to 20 birds (U.S. Fish and Wildlife Service in Salo, 1975). However, in March and April at the onset of migration, particularly in the spring, flocking into large groups occurs. For example, flocks of 150 to 200 birds have been reported on eastern side of Vancouver Island (Munro, 1942, in Salo, 1975). A flock of 1,000 was recorded in 1906 near Port Townsend (131) and a flock of 500 was observed in early September 1976 near Green Point, Port Angeles Harbor (Wahl, 1976).

HABITAT REQUIREMENTS - The red-necked grebe inhabits ocean waters, open waters of major entrance channels, reefs and channels of "inside waters", waters over tidal flats, small and large estuaries and protected harbors where it feeds primarily on fish such as herring, pilchard and stickleback (Salo, 1975 and Wahl, 1976). The red-necked grebe appears to prefer sheltered waters close to the shore (132).

CRITICAL HABITAT AREAS - The red-necked grebe is widely distributed throughout the waters of Washington and no specific sites have been mapped as critical. However, several important concentration areas have been mapped and include Hale Pass, Drayton Harbor, and many channels in San Juan Archipelago, i.e., the southern end of San Juan Channel, Thatcher Pass, Harney Channel, Wasp Pass, Speiden Channel, Obstruction-Peavine Pass, and the waters near Green Point on east side of Port Angeles Harbor (Wahl, 1976).

DATA GAPS - Systematic censusing of migrating and breeding populations and mapping of flocking and feeding areas.

REFERENCES - Salo 1975, Wahl 1976, 131, U.S. Fish and Wildlife Service in Salo 1975, Munro 1942 in Salo 1975, 132, Wahl and Paulson 1973.

FACT SHEET

B-5 HORNED GREBE

Podiceps auritus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor (September to early May) on open salt waters of Puget Sound and sheltered bays along the Pacific Coast (131, 132, Wahl and Paulson, 1973). It is also a rare non-breeding summer visitor in saltwater habitats. In addition, it is an uncommon summer visitor to freshwater marshes of the San Juan Islands and Eastern Washington. The horned grebe is usually observed in small groups although sightings of 100 birds in a flock have been recorded at Port Gamble (Evans, personal communication in Salo, 1975).

HABITAT REQUIREMENTS - The horned grebe inhabits open water habitats of major entrance channels, "inside water" channels and reefs, waters over tidal channels, small and large estuaries and protected harbors (Wahl, 1976), where it feeds on fish, molluscs and crustaceans (132). It appears to prefer quiet water as opposed to rougher open water.

CRITICAL HABITAT AREAS - At present there do not appear to be any specific sites to be mapped as critical habitats. Many of the open water concentration areas already listed for loons and other grebes are also importnat to the horned grebe. The continued maintenance of high quality open water habitat will be important to the well being of the horned grebe populations.

DATA GAPS - Systematic census of migrating and wintering populations and mapping of feeding and flocking areas.

REFERENCES - Salo 1975, 131, 132, Wahl 1976, Wahl and Paulson 1973.

FACT SHEET

B-6 EARED GREBE

Podiceps nigricollis

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Uncommon migrant and winter visitor (September to May) in saltwater bays and inlets and freshwater lakes in Western Washington. It is also a migrant and summer visitor on freshwater marshes and lakes of Eastern Washington (131, Wahl, 1976, Wahl and Paulson, 1973). It generally occurs in small flocks although migrating flocks from 200 to 250 have been sighted in Wallapa Bay and San Juans (Salo, 1975). Winter observations are generally of individual birds or small flocks of perhaps as many as 15 to 20 birds.

HABITAT REQUIREMENTS - The eared grebe utilizes the open water habitat of "inside water" channels and reefs, water over tidal flats, small and large estuaries and protected harbors, where it feeds primarily on crustaceans, mysids and amphipods (Salo, 1975).

CRITICAL HABITATS - No specific sites are mapped as critical. Some of the known concentration areas include Willapa Bay National Wildlife Refuge (400 birds in December, 773), Strait of Juan de Fuca coastline (905), San Juan Archipelago waters and Padilla Bay (772).

DATA GAPS - Systematic censuses of migrating and wintering populations and mapping of feeding and flocking areas.

REFERENCES - Salo 1975, 131, 132, Wahl 1976, 773, 772, 905, Wahl and Paulson 1973.

FACT SHEET

B-7 WESTERN GREBE

Aechmophorus occidentalis

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common winter visitor and migrant in salt water and less common in fresh water lakes of Western Washington. Locally common summer breeder and migrant in fresh water of Eastern Washington. Some non-breeders found in coastal areas in summer. Large migrating and wintering flocks of several thousand birds often occur in saltwater bays and inlets (131, 132, Wahl and Paulson, 1973).

HABITAT REQUIREMENTS - The western grebe inhabits open ocean waters, major entrance channels, "inside water" reefs and channels, waters over tidal flats, small and large estuaries and protected harbors where it feeds primarily on fish.

CRITICAL HABITAT AREAS - Areas of large concentrations of western grebes have been mapped as critical. These areas include:

Eighteen mile stretch of coast between Willoughby and Destruction Islands, 34,000 birds recorded in October (904).

Northeast Samish Bay and waters extending into Bellingham Bay, 10,000 to 20,000 birds winter in the area and individual flocks as high as 5,000 have been sighted (Wahl, 1975, Jeffrey, 1976).

Fidalgo Bay, Padilla Bay and waters between mouth of Guemes Channel and Hat Island - winter flocks as high as 5,000 birds,(Jeffrey, 1976).

Coastal waters near Cape Disappointment - flocks totaling 10,000 on a single survey (Welch, 1976).

Other known concentration areas mapped as important include Willapa Bay National Wildlife Refuge (2,000 in December, 1973), Skagit Bay, particularly near Hope Island and Kiket Island (1,000 in winter, Jeffrey, 1976), Utsalady Bay (1,000 in March, 903), Columbia River estuary in area of Lewis and Clark Refuge (Welch, 1976), Dungeness Bay and Spit, Sequim Bay and Inlet, to Herr Inlet, Discovery Bay, Hood Canal, Eld Inlet, Henderson Inlet, Deception Pass, Portage Bay, Hales Passage, Lummi Bay, Drayton Harbor and Birch Bay (Wahl, 1976).

DATA GAPS - Systematic censusing of migrating and wintering populations and mapping of feeding areas.

REFERENCES - Wahl 1976, 131, 132, Wahl and Paulson 1973, Jeffrey 1976, Salo 1975, Welch 1976, 903, 773, Wahl 1975, 904.

FACT SHEET

B-8 DOUBLE-CRESTED CORMORANT[1]

Phalacrocorax auritus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common year-round resident in open salt water and rock habitats of Pacific Coast and Puget Sound. It is also a winter visitor and migrant to freshwater lakes of Western Washington and rare summer visitor in Eastern Washington freshwater habitats (131, 132, Wahl and Paulson, 1973). During the non-breeding period they are usually found in small groups of usually less than 50 birds (Salo, 1975).

HABITAT REQUIREMENTS - The double-crested cormorants feed on fish of the open ocean waters, "inside water" channels and reefs, small and large estuaries, protected harbors, and in particular, major entrance channels. Nesting occurs on rocks and rocky islands. Ocean jetties and rocky undeveloped beaches are used primarily as resting areas (Wahl, 1976).

CRITICAL HABITAT AREAS - Critical habitats mapped are major rocky island nesting sites. These include several islands in the Washington Islands National Wildlife Refuge and the numbers presented are annual peak production figures from 1970 to 1974.

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[1]Available information was not subspecies-specific to *P.a. cincinatus* and *P.a. albociliatus* as on DOE's bird list. These subspecies can only be identified by close physical examination. The bulk of the literature information is for the species *P. auritus*, the double-crested cormorant.

Grenville Islands - Peak production of 135 young (904)

Grenville Arch - Peak production of 70 young (904)

Split Rock - Peak production of 210 young (904)

Willoughby Rock - Peak production of 190 young (904)

Quillayute Needles - Peak production of 105 young (904)

Sea Lion Rock - Peak production of 105 young (904).

Other large nesting sites in Washington waters include:

San Juan Islands National Wildlife Refuge - 90 birds produced 120 young (773). (Not mapped because specific islands not known.)

Bird Rocks - 60 breeding birds (907)

Lummi and Viti Rocks - 40 to 50 breeding birds (912).

In addition to these larger concentration areas there are other known and probably unknown nesting sites on rocks and rocky islands in the study area which need to be further investigated.

DATA GAPS - Population and distribution studies of nesting double-crested cormorants in rocky habitats need to be initiated.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 904, 773, 912, 907.

FACT SHEET

B-9 BRANDT'S CORMORANT

Phalacrocorax penicillatus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common permanent resident and breeder in open salt water and rocky habitats of Pacific Coast, Strait of Juan de Fuca and northern Puget Sound. More numerous in inshore waters and on Puget Sound in winter (131, Wahl 1976, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The Brandt's cormorant feeds on fish in open waters of the coast, "inside water" channels and reefs, small and large estuaries, protected harbors, and in particular major entrance channels. It nests on rocks and rocky islands. Ocean jetties and rocky undeveloped beaches are used as resting sites (Wahl 1976).

CRITICAL HABITATS - Critical habitats mapped are rocky island nesting sites. These primarily are several islands in the Washington Islands National Wildlife Refuge. Numbers presented are annual peak population estimates for the years 1970 - 1974.

Grenville Islands - Peak production of 60 young (904)

Grenville Arch - Peak production of 45 young (904)

Willoughby Rock - Peak production of 105 young (904)

Quillayute Needles - Peak production of 100 young (904)

The Brandt's cormorant also nests on Tatoosh Island (Welch 1976) and possibly several other rocky habitat locations. Nests were recorded on Matia and Lopez Islands in the San Juan Archipelago in earlier times (132).

DATA GAPS - Systematically census breeding populations, map breeding sites and feeding areas. Implement ecological studies on nesting and feeding requirements.

REFERENCES - 131, 132, Wahl 1976, Welch 1976, 904. Wahl and Paulson 1973.

FACT SHEET

B-10 PELAGIC CORMORANT

Phalacrocorax pelagicus

LIFE HISTORY -See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common permanent resident and breeder in salt water and rocky habitats along Pacific Coast and in San Juan Islands. Common winter resident in Puget Sound (August to June) with fewer birds present in the summer. (131, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The pelagic cormorant feeds in open waters of the coast, small and large estuaries, protected harbors and in particular major entrance channels and "inside water" channels and reefs (Wahl 1976).

It feeds on fish in waters over the intertidal zone of rocky shores (Salo 1975) and in deeper offshore waters.

Its nests are located in fissures and alcoves of ledges, faces of vertical cliffs and rocky slopes of islands particularly along the coasts (Salo 1975, and 131). Ocean jetties and rocky undeveloped beaches are often used as resting sites (Wahl 1976).

CRITICAL HABITAT AREAS - Critical habitats mapped are major rocky island nesting sites. These include several islands in the Washington Islands National Wildlife Refuge. Numbers presented are annual peak population estimates for the years 1970 - 1974. These include:

Grenville Islands - Peak production of 804 young (904)

Willoughby Rock - Peak production 40 young (904)

South Rock - Peak production of 35 young (904)

Abbey Islet - Peak production of 48 young (904)

Middle Rock - Peak production of 24 young (904)

North Rock - Peak production of 70 young (904)

Alexander Island - Peak production of 40 young (904)

Rounded Island - Peak production of 20 young (904)

Giants Graveyard - Peak production of 20 young (904)

Quillayute Needles - Peak production of 90 young (904)

James Island - Peak production of 65 young (904)

Cake Rock - Peak production of 215 young (904)

Carroll Island - Peak production of 110 young (904)

Bald Island - Peak production of 110 young (904)

White Rock - Peak production of 175 young (904)

Bodelteh Island - Peak production of 120 young (904)

Spike Rock - Peak production of 36 young (904)

Father and Son - Peak production of 20 young (904)

Other large nesting colonies include Tatoosh Island which had 200 nesting pairs in 1975 (Welch 1976), Protection Island (Smith 1976), Ozette Island (55 nests, 185).

There are several nesting colonies in the San Juan Island Archipelago although most of them are relatively small 20-30 nesting pairs (Salo 1975). One of the larger colonies include Colville Island (44 nests 180).

DATA GAPS - Systematically census and map breeding colonies and feeding areas.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Wahl 1976, 904, Smith 1976, Welch 1976, 185, 180.

FACT SHEET

B-11 WHISTLING SWAN

Olor columbianus

LIFE HISTORY - See WDG Report, Eaton 1975.

WASHINGTON DISTRIBUTION - Fairly common migrant and uncommon winter visitor in open salt water and fresh water habitats of the state. During migration the whistling swan is found throughout the state on lakes, large rivers and salt water. More localized in winter on lowland lakes and salt water shorelines of Western Washington and open waters of the Columbia (131, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - Major winter concentration areas have been mapped as critical. These include the:

Skagit River Estuary and Delta - approximately 100 - 150 birds in winter (Wahl 1976, Jeffrey 1976)

Nooksack River Delta - in north Bellingham Bay where approximately 20-35 birds winter (Wahl 1976, Jeffrey 1976).

Columbia River Estuary - peak wintering and staging area populations of 2,000. Use several islands and surrounding waters in the Lewis and Clark National Wildlife Refuge (Welch 1976).

Other important winter concentration areas include Leadbetter Point, Nasselle and Palix River estuaries; Grays Harbor (specific areas not mapped) and Nisaqually Delta and estuary (Wahl 1976).

DATA GAPS - Systematically census migrating and wintering populations. Importance of various staging areas such as Lewis and Clark National Wildlife Refuge should be investigated. Onshore feeding sites of whistling swans should also be investigated and their importance correlated with salt water usage areas.

REFERENCES - Eaton 1975, 131, Wahl 1976, Jeffrey 1976, Welch 1976, Wahl and Paulson 1973.

FACT SHEET

B-12 WESTERN CANADA GOOSE

Branta canadensis occidentalis

LIFE HISTORY - See WDG Report Eaton 1975, Salo 1975.

WASHINGTON DISTRIBUTION - Western Canada goose occurs in Washington as an uncommon migrant and winter resident in salt water along the immediate ocean coast and the Straits of Juan de Fuca. It also occurs in the vicinity of Skagit Flats and as far south on Puget Sound as Nisqually Flats. A small breeding stock is currently being established at Willapa National Wildlife Refuge (Eaton 1975).

HABITAT REQUIREMENTS - The Western Canada goose inhabits open waters of large estuaries and coastal bays and feeds chiefly along tidal flats, salt marshes and nearby meadows (Eaton 1975).

CRITICAL HABITAT AREAS - The major migration and winter concentration areas mapped as critical are:

Willapa Bay National Wildlife Refuge - where 2,000 have been counted in November (773)

Leadbetter Point - a flock of 3,000 has been sighted flying northward in May (771)

"Offshore Willapa Bay" - several migrating flocks have been seen (Salo, 1975).

Other small important concentration areas include open water near Strawberry Bay, Cypress Island, Dungeness National Wildlife Refuge, Port Gamble, Skagit Bay, Port Susan, Nisqually Delta and Flats (773, 901, Jeffrey 1976).

DATA GAPS - Detailed inventories should be made to determine population numbers and distribution of western Canada goose. Research concerned with the biology and ecology of this subspecies of the Canada goose within the state should be undertaken. (Eaton 1975).

REFERENCES - Eaton 1975, Salo 1975, 771, 773, 901, Jeffrey 1976.

FACT SHEET

B-13 BLACK BRANT

Branta nigricans

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Locally common migrant (mostly September to late November and February to mid-May) and winter resident in saltwater habitats of Puget Sound, Straits of Juan de Fuca and in sheltered bays and inlets of Pacific Coast. More common during spring migration than in fall and winter months (131, 132, Wahl and Paulson, 1973).

HABITAT REQUIREMENTS - This species utilizes open water of large estuaries and protected harbors as resting areas. They also rest and gravel on sandy islands, spits and undeveloped sandy beaches and mudflats. Their primary feeding areas are eelgrass beds which are essential to their survival (Wahl 1976).

CRITICAL HABITAT AREAS - Major concentration areas mapped as critical include:

Fidalgo, Padilla and Samish Bays - Area contains large open-water bays and extensive eelgrass beds. Area is most heavily utilized in March and April. Average spring peak populations from 1970-1974 were 32,230 and average midwinter inventory populations from 1970-1974

were 4,312 (Jeffrey, 1975). Data indicates that for a brief period in April the waters of these bays host from one-third to one-half of the total Pacific Flyway black brant population. It is not inconceivable that some time during their spring migration, most of the 125,000 to 150,000 in the Flyway utilize these bays for feeding and resting (Jeffrey, 1975).

Willapa Bay - This is an important migration and wintering area. Peak migration numbers for entire Bay have been as high as 50,000 birds (U.S. Army Corps of Engineers, 1976). Wintering population of 2,300 was recorded in January, (973, Jeffrey, 1976). The Willapa Bay contains broad mudflats and extensive eelgrass beds which provide food, gravel and loafing space vital to survival of migrating and wintering flocks along the Washington Coast (U.S. Fish and Wildlife Service, 1970).

Dungeness Bay and Inside the Spit - Counts of 7,600 birds in March and April and 600 in December (773). Area includes bay, inside the spit and Jamestown area shoals which is a primary brant winter feeding area (Smith 1976).

Grays Harbor - Important resting and feeding habitat (approximately 11,500 acres of eelgrass beds) for migrating flocks. Habitat destruction in other coastal bays has increased usage of Grays Harbor (U.S. Army Corps of Engineers, 1975).

Belfair Area of Hood Canal - Migration populations as high as 1,500 birds have been recorded (Jeffrey, 1976).

Other important concentration areas include Lummi Bay, northwestern side of Lummi Island, northwestern Bellingham Bay, Drayton Harbor, eastern side of Sinclair Island, Totten Inlet, Birch Bay, Dugualla Bay, Port Susan Bay, Nisqually Flats (Wahl, 1976, Jeffrey, 1976).

DATA GAPS - Major concentration areas of black brant in Washington appear to adequately known. More detailed mapping of eelgrass beds in the state is needed and population index studies should continue. Studies should be initiated to explore why brant populations have decreased in some areas such as Dungeness but not in others such as Padilla Bay.

REFERENCES - 131, 132, 773, Wahl and Paulson 1973, Wahl 1976, Jeffrey 1975, Jeffrey 1976, U.S. Army Corps of Engineers 1976, U.S. Fish and Wildlife Service 1970, U.S. Army Corps of Engineers, 1975, Salo 1975.

FACT SHEET

B-14 WHITE-FRONTED GOOSE

Anser albifrons

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (April to mid-May) and fall (September to October) migrant and uncommon winter resident mainly along salt water. Very common migrant along ocean coast especially from mouth of Columbia to Leadbetter Point. A few birds winter in Puget Sound. Rare migrant in Eastern Washington (131, 132, Wahl and Paulson 1973, Salo 1975).

HABITAT REQUIREMENTS - The white-fronted goose rests in open water habitats of the coast and large estuaries and tidal flats. It feeds in salt marsh habitats and upland meadows and fields (Wahl 1976, 131).

CRITICAL HABITAT AREAS - No critical habitat areas have been mapped. Some of the common concentration areas in addition to the one already mentioned include Willapa Bay (60 in August, 773), Leadbetter Point (60 in May 771), and Dungeness Bay and Spit (772).

DATA GAPS - Systematic census of migrating and wintering populations. Map salt marsh and upland feeding areas.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 773, 771, 772.

FACT SHEET

B-15 SNOW GOOSE

Chen caerulescens

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring and fall migrant along the coast, Puget Sound and in interior of Western Washington. Winters irregularly throughout state on rivers and larger lakes, particularly abundant on flats at mouth of Skagit River. Rare migrant east of Cascades and rare summer straggler in salt water habitats (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The snow geese feed in moist meadows and fields, tideflats and salt marshes. They rest in open salt water habitats of large estuaries (Wahl 1976, 131).

CRITICAL HABITAT AREA - The critical areas mapped are:

Skagit Flats and Bay and Port Susan Bay - These geese are in the area from October to April with the entire winter flock in from mid-December to February. The long term average wintering population in the area is 21,000 and 15,400 were counted in January 1976. This is the major wintering area of the snow goose population that breeds on Wrangel Island in Russia. The next major snow goose wintering area on the West Coast is in Sacramento, California (Jeffrey 1976).

DATA GAPS - Need further research on the feeding and habitat requirements of snow geese in the state.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, Jeffrey 1976.

FACT SHEET

B-16 MALLARD

Anas platyrhynchos

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and permanent resident in fresh water and salt water habitats throughout the State. Less often seen on salt water but often very common at mouths of large rivers emptying into salt water such as mouth of Dungeness River and Skagit River. Very common winter resident in sheltered waters, fjords and bays of Puget Sound (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The mallard feeds in mudflats and salt marsh. It utilizes sandy islands, sandy spits, and the open waters of small and large estuaries as resting areas (131, Wahl 1976).

CRITICAL HABITAT AREAS - Critical sites mapped include major migration and winter usage areas which include:

Samish, Padilla, Fidalgo, Port Susan and Skagit Bays Area. - These are important during both fall migration and the winter (Jeffrey 1976). Population censuses over last 19 years have averaged 21,000 to 32,000 in October, 35,000 to 44,000 in November and 19,500 to 26,800 in December (Salo 1975).

Nooksack River Delta in Lummi and Bellingham Bays - Important fall migration and winter area (Jeffrey 1976) with 6,000 mallards counted during the winter (188).

Willapa Bay - Peak fall migration population numbers in the National Wildlife Refuge are over 4,000 (773). January counts of 700 (773). Most important as fall migration stopover area (Jeffrey 1976).

Dungeness Bay to Sequim Bay - Spring migration counts at National Wildlife Refuge at over 5,000. Winter counts of 2,500 (773). Important as fall and spring migration stopover and wintering areas (Jeffrey 1976).

Grays Harbor - Most important as a fall migration stopover area. November counts of over 7,000 in 1974. December and January counts of 500 and less. (Smith and Mudd 1975).

Columbia River Estuary in and near Lewis and Clark National Wildlife Refuge - Important stopover area in late winter and spring (Welch 1976).

Nisqually Delta - Important migration and winter area (Jeffrey 1976). Estimates of approximately 600 in November 1975 and 400 in March 1976 (Hocutt 1976).

DATA GAPS - Annual migration and winter population censuses need to be expanded to cover more of the coastal and estuarine areas.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 188, 773, Smith and Mudd 1975, Welch 1976, Jeffrey 1976, Hocutt 1976.

FACT SHEET

B-17 PINTAIL

Anas acuta

LIFE HISTORY - See WDG, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter resident (mid-August to May) in salt water and fresh water habitats throughout the State. Uncommon summer breeder in Eastern Washington (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The pintail forages in tideflats, salt marshes and meadows drowned by shallow, brackish waters. It utilizes sandy islands and the open waters of large estuaries and protected harbors as resting areas (Wahl 1976).

CRITICAL HABITAT AREAS - Critical sites mapped include major migration and winter usage areas.

Samish, Padilla, Skagit and Port Susan Bays Area - It is important during both fall migration and winter (Jeffrey 1976). The 19-year monthly averages, based on censuses in the region, are: 30,500 to 38,500 birds in October and November and 8,000 to 10,000 birds in December (Salo 1975).

Nooksack River Delta in Lummi and Bellingham Bays - Important fall migration and winter area (Jeffrey 1976) with winter counts of approximately 5,000 (188).

Dungeness Bay to Sequim Bay - Important as a fall migration and winter area (Jeffrey 1976). October counts of 9,000 birds and January counts of 1,300 (773).

Willapa Bay - Important fall migration stopover area with October counts of 35,000 birds in the National Wildlife Refuge (773).

Grays Harbor - Important fall migration stopover area with September counts of over 14,000 (Smith and Mudd 1975).

Columbia River Estuary in and near Lewis National Wildlife Refuge - Important stopover area during late winter and spring (Welch 1976).

Nisqually River Delta - Important migration and winter area (Jeffrey 1976). Estimates of 400 in October 1975 and March 1976 (Hocutt 1976).

DATA GAPS - Expand the migration and winter counts to cover more of the salt water habitat, particularly in Puget Sound and San Juans.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, Jeffrey 1976, 188, 773, Smith and Mudd 1975, Welch 1976, Hocutt 1976.

FACT SHEET

B-18 GREEN-WINGED TEAL

Anas crecca

LIFE HISTORY - The green-winged teal is an abundant breeder in midwestern America and Canada, western Canada and Alaska. It is mainly a migrant in Washington although a few nest and winter. It nests on shallow marshy bodies of fresh water, usually on dry ground at some little distance away (131). Its diet is usually nine-tenths vegetable, i.e., sedges pond weeds, grasses and smart weed. The animal portion is made up of crustaceans, insects and mollusks (132).

WASHINGTON DISTRIBUTION - Common migrant and winter visitor on salt and fresh water habitats of Western Washington. Scattered summer visitor and breeder in freshwater habitats of the State (131).

HABITAT REQUIREMENTS - The green-winged teal feeds on animal and plant foods in mudflats and salt marshes. It utilizes sandy islands and the open water of large estuaries and protected harbors as resting areas (131, 132, Wahl 1976).

CRITICAL HABITATS - Concentration areas overlap with those previously mentioned for the mallard and pintail. Estimates of approximately 200 for Grays Harbor in April and September (Smith and Mudd 1975), 3,000 at Dungeness Bay in January 1975 (Hocutt 1976) and 900 in March 1975 at Nisqually Flats (Hocutt 1976). No specific sites mapped as critical.

DATA GAPS - Systematically census migrating and wintering populations.

REFERENCES - 131, 132, Wahl 1976, Smith and Mudd 1975, 188, Hocutt 1976.

FACT SHEET

B-19 AMERICAN WIGEON

Anas americana

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Abundant migrant and winter visitor in salt and fresh water habitats of Western Washington, less common as a summer visitor. Primarily a migrant in Eastern Washington (131). From October to April it is perhaps the most common duck in Puget Sound waters (Salo 1975).

HABITAT REQUIREMENTS - Wigeon feed on vegetation in tideflats, salt marsh, meadows and fields. It rests on sandy islands and open waters of large and small estuaries and protected bays (131, Wahl 1976).

CRITICAL HABITATS - Sites mapped as critical include major migration and winter concentration areas.

Port Susan, Padilla, Samish and Skagit Bays - Major fall migration and winter area. Padilla and Samish have largest winter flocks but in October most are in Skagit Bay (Salo 1975). The 19-year monthly averages for the four bay areas are 23,400 to 33,000 in October, 35,000 to 38,000 in November and 21,000 to 31,500 in December (908). January counts of 6,600 in Padilla Bay and 13,900 in Samish Bay (908).

Willapa Bay - Important fall migration stopover area. As many as 100,000 may gather in November (773).

Grays Harbor - Important fall migration stopover area. October counts of approximately 30,000 (Smith and Mudd, 1975).

Dungeness Bay and Spit - Important fall migration and winter area. October counts of 36,000 and January counts of 15,000 (773).

Nooksack River Delta in Lummi and Bellingham Bays - Important fall migration and winter area (Jeffrey 1976). Counts of 2,000 in Bellingham Bay in February (771).

Nisqually Delta - Important fall migration and winter area (Jeffrey 1976). Counts of approximately 7,000 in October 1975 and 2,000 in January 1976 (Hocutt 1976).

Columbia River Estuary in and near Lewis and Clark National Wildlife Refuge - Important stopover area during late winter and early spring (Welch 1976).

DATA GAPS - Systematically census migrating and wintering populations.

REFERENCES - Salo 1975, 131, Wahl 1976, 908, 773, Smith and Mudd 1975, Hocutt 1976.

FACT SHEET

B-20 NORTHERN SHOVELER

Anas clypeata

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common winter visitor and migrant in fresh and salt water habitats of Western Washington. Common summer visitor and breeder on lakes and sloughs east of the Cascades. Prefers sheltered waters and can be found in channels and bays in small flocks of 20 to 100 birds (Salo 1975).

HABITAT REQUIREMENTS - Feeds on vegetation and animal matter, primarily molluscs in tidal flats and salt marsh. Rests in open waters of estuaries and protected harbors and channels (Wahl 1976, 131, 132).

CRITICAL HABITATS - No areas are mapped. Concentration areas overlap with mallard, wigeon, and other dabbling ducks. Peak numbers in concentration areas are usually less than 500 (773, 771, Hocutt 1976).

DATA GAPS - Systematically census migrating wintering populations.

REFERENCES - Salo 1975, Wahl 1976, 131, 132, 773, 771, Hocutt 1976.

FACT SHEET

B-21 CANVASBACK

Aythya valisineria

LIFE HISTORY - See WDG Reports, Salo 1975, Eaton 1975.

WASHINGTON DISTRIBUTION - Uncommon migrant and winter visitor on salt water and fresh water in the State, being more numerous west of the Cascades. Uncommon summer visitor and breeder on lakes in Eastern Washington (131, 132). Canvasback populations are at low levels in many areas of the United States because of alterations to nesting and brooding habitat and other man-caused impacts (Smith and Mudd, 1975).

HABITAT REQUIREMENTS - Utilizes open waters over tideflats, inlets, bays, estuaries and protected harbors where it feeds on vegetable matter e.g., sedges, eelgrass and animal matter, i.e., molluscs, crustaceans, insects and small fish (Wahl 1976, Salo 1975).

CRITICAL HABITATS - Major winter concentration areas are mapped as critical.

North Padilla Bay and Samish Bay - Winter populations of 1,500 to 2,000 (Jeffrey 1976).

Willapa Bay - Both Willapa Bay and Grays Harbor are becoming increasingly important for survival of canvasback in the Western United States, particularly because of habitat loss in San Francisco Bay. Willapa Bay, Grays Harbor, North Padilla Bay, Samish Bay Area, San Francisco Bay, and Humboldt Bay are the major West Coast wintering areas (U.S. Army

Corps of Engineers, 1976). Peak wintering populations in Willapa Bay are approximately 1,600. (Welch 1976).

Grays Harbor - Peak wintering counts of almost 1,100 (Smith and Mudd, 1975).

Whidbey Island Basin Area, i.e., - Admiraly Inlet, Saratoga Passage, Penn Cove, Oak, Crescent and Holmes Harbors - Average wintering population 390 with peaks up to 1,280 (Jeffrey, 1976, 900).

Dungeness Bay and Spit - Up to 150 counted during December and January (773).

Elliot Bay and Surrounding Sound Waters - December counts of over 200 (190).

Other less important wintering areas include Port Susan Bay, Drayton Harbor, and Budd Inlet (Jeffrey 1976).

DATA GAPS - Systematic winter counts should be expanded over more coastal and estuarine waters in Washington. Studies should be initiated to determine specific wintering habitat requirements so that quality winter habitat can be preserved.

REFERENCES - Salo 1975, Eaton 1975, Smith and Mudd 1975, 131, 132, Jeffrey 1976, Welch 1976, U.S. Army Corps of Engineers 1976, 900, 773.

FACT SHEET

B-22 GREATER SCAUP

Aythya marila

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor west of the Cascades, primarily on salt water bays, inlets and estuaries. Uncommon migrant and winter visitor in Eastern Washington (131). Also uncommon non-breeding summer visitor in salt waters of Western Washington (Wahl, 1976).

HABITAT REQUIREMENTS - The greater scaup rests and feeds in open waters over tideflats and in bays, inlets, estuaries and protected harbors (131, Wahl, 1976). It dives to feed on deep water bottom plants, molluscs and crustaceans. Its movements are often governed by the spawning run movements of one of its major food sources, the Pacific herring (878).

CRITICAL HABITATS - Major migration and winter areas have been mapped as critical.

Padilla Bay - Important fall migration stopover area and winter area. Populations of scaup species in fall migration usually near 10,000 and as many as 50,000 greater scaup have been sighted on one occasion (Jeffrey 1976, Parker 1975). Padilla Bay and surrounding areas, i.e., Samish Bay, Saratoga Passage, Port Susan, Skagit Bay and Admiralty Inlet have had maximum scaup species January counts of 38,000

with averages being 20,000 (900).

Lower Columbia River Estuary - Late winter counts of 10,000 scaup in Lewis and Clark National Wildlife Refuge area (Welch 1976).

Other important concentration areas include Grays Harbor (1,630 scaup sp. in March and 613 in November (Smith and Mudd, 1975), Willapa Bay (425 in January, 904), Dungeness Bay (1,200 in April, 773), Bellingham (642 in December to January, 188), Seattle-Elliot Bay Area (2,647 in December, 190).

DATA GAPS - Systematic censuses of wintering and migrating populations. Map feeding areas.

REFERENCES - Salo, 1975, 131, Wahl 1976, 878, Jeffrey 1976, Parker 1975, 900, Welch 1976, Smith and Mudd 1975, 904, 773, 188, 190.

FACT SHEET

B-23 LESSER SCAUP

Aythya affinis

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor in the state mostly on fresh water. Uncommon summer visitor east of Cascades. Non-breeding summer visitor found throughout the State. Less common on salt water bays and larger lakes than small lakes, ponds and rivers (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - Scaup dive in open waters over tideflats and in estuaries and protected harbors to feed on aquatic vegetation and animal matter including molluscs, crustaceans, fish and insects (Salo 1975, Wahl 1976). They also rest in these open water habitats.

CRITICAL HABITAT AREAS - No specific areas mapped. Many of concentration areas overlap with greater scaup. Counts given under greater scaup for Padilla Bay area, Lower Columbia River, Grays Harbor were for both species. Appears to be also common in waters near Strawberry Bay, Cypress Island from October to May (774).

DATA GAPS - Systematic censuses of wintering and migrating populations. Map feeding areas.

REFERENCES - 131, 132, Wahl and Paulson 1973, Wahl 1976, 774, Salo 1975.

FACT SHEET

B-24 COMMON GOLDENEYE

Bucephala clangula

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor (mid October to mid April) more common west of the Cascades on both fresh and salt water. It is also a rare non-breeding summer visitor. Prefers sheltered waters in Puget Sound and bays along the Coast (131). Flock sizes generally of 20 to 30 but larger flocks of over 100 have been sighted. Often found with other diving ducks in mixed loose flocks (Salo 1975).

HABITAT REQUIREMENTS - The common goldeneye feeds primarily on mollusks and crustaceans in open waters over mud flats and other bottom substrates. It rests in open ocean waters and open waters of large and small estuaries and protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - One large important concentration area mapped is the Admiralty Inlet, Saratoga Passage, Port Susan, Padilla and Skagit Bays Area. Winter concentrations including Barrow's Goldeneye in this area ranged from 3,000 to 16,500 birds over an 8 year period with the annual average being 5,700 (900). No critical areas are mapped.

DATA GAPS - Systematic censusing of wintering and migrating populations. Map feeding areas.

REFERENCES - Salo 1975, 131, Wahl 1976, 900.

FACT SHEET

B-25 BARROW'S GOLDENEYE

Bucephala islandica

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Uncommon to common migrant and winter visitor (November to April) mostly west of the Cascades, where it is mainly found on protected salt water bays and coves in Puget Sound and along coast. Nests on lakes at moderate to high elevations in the Cascades and occasionally in Eastern Washington (131, 132, Wahl and Paulson 1973). In general the Barrow's goldeneye is less abundant than the common goldeneye. Flock sizes generally range from a few birds to as many as 30. Large flocks of over 200 have been observed at Dungeness National Wildlife Refuge in November and December. (Salo 1975).

HABITAT REQUIREMENTS - Like the common goldeneye it feeds primarily on molluscs and crustaceans in open waters over tideflats. It rests in open waters of small estuaries and in particular protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - The Barrow's goldeneye concentrate with the common goldeneye in the Admiralty Inlet, Saratoga Passage, Padilla, Skagit and Port Susan Bays area. Large numbers up to 500 have also been observed at Dungeness National Wildlife Refuge in December (773). No critical areas are mapped.

DATA GAPS - Systematic censuses of migrating and wintering concentrations. Map feeding areas.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 773.

FACT SHEET

B-26 BUFFLEHEAD

Bucephala albeola

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor (late October to May) on salt water and fresh water in the state being more numerous in the coastal areas and Puget Sound where a few non-breeders may be seen in the summer. Possible scarce breeder on lower mountain lakes (131, 132, Wahl and Paulson 1973). It can be very abundant with congregations of 1,000 to 2,000 birds occurring (132).

HABITAT REQUIREMENTS - The bufflehead feeds in open water and dives for crustaceans and mollusks of the mud flats and other bottom substrates and also dives for fish. It rests on open waters of large and small estuaries and in particular protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - Major important winter concentration areas mapped include: Dungeness Bay and Spit Area - Up to 4,600 birds reported in December and January (773, Hocutt 1976). Admiralty Inlet, Saratoga Passage, Padilla, Port Susan, Skagit Bay Area - Winter populations ranging from 3,800 to 12,800 birds with a six year average of 7,650 birds (900). San Juan Archipelago Waters - 5,600 birds in January (64). (No specific areas mapped). Other winter concentration areas include Bellingham Bay (824 - December to January, 188), Willapa Bay [800 in January 773), Grays Harbor [600 in March (Smith and Mudd 1975)]. No critical areas are mapped.

DATA GAP - Systematic censuses of migrating and wintering populations throughout salt water habitats. Mapping of feeding areas.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 773, 900, 64, 188, Smith and Mudd 1975, Hocutt, 1976.

FACT SHEET

B-27 OLD SQUAW

Clangula hyemalis

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Uncommon migrant and winter visitor (November to May) on salt water in Western Washington. Rare but regular migrant east of the Cascades. A few non-breeding birds occur on salt water in summer. It is also a rare winter visitor on fresh water in Western Washington (131, 132, Wahl and Paulson 1973). It is very local in its occurrance in salt water of Western Washington and usually does not appear in larger numbers. Winter populations often fluctuate from year to year (Eaton 1975).

HABITAT REQUIREMENTS - The old squaw dives for crustaceans, mollusks and fish and rests in open waters of the ocean coast, large estuaries, protected harbors and in particular major entrance channels (Wahl 1976). It appears to prefer the deep water areas (Salo 1975).

CRITICAL HABITAT AREAS - Major winter concentration areas generally overlap with other diving ducks although it generally prefers a little deeper water. Important concentration areas include Dungeness Bay (260 in January, 773), San Juans National Wildlife Refuge (90 in March, 773), Admiralty Inlet, Saratoga Passage, Port Susan, Skagit and Padilla Bay Area-January populations range from 100 to 1450 with 7 year average of 450 (900). No critical areas are mapped.

DATA GAPS - Need systematic counts of migration and winter populations. Determine specific habitat requirements for Washington waters.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Eaton 1975, Wahl 1976, 773, 900.

FACT SHEET

B-28 HARLEQUIN DUCK

Histrionicus histrionicus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Permanent resident, breeding along mountain streams and rivers and common migrant and winter resident (October to May) on salt water primarily along ocean coast in northern Puget Sound. Less common on salt water in summer and in the interior of Washington in the winter. Only a rare migrant and summer visitor in Eastern Washington (131, 132, Wahl and Paulson 1973). Usually observed in pairs or small flocks although larger flocks (approximately 100) have been sighted (Salo 1975).

HABITAT REQUIREMENTS - The harlequin duck utilizes sandy spits, rocky habitats of reefs, beaches and islands, and the open water of ocean waters and major entrance channels. It feeds by diving for crustaceans and molluscs particularly over rocky habitats (Wahl 1976).

CRITICAL HABITAT AREAS - No areas have been mapped. Some of the known concentration areas include Tatoosh Island waters (30 in June, 771), Destruction Island waters (50 in June and July, 907), Dungeness National Wildlife Refuge (65 in January, 773), Smith Island waters (150 in May, 907), Protection Island waters (90 in June and July, 907), San Juan Islands National Wildlife Refuge (175 in February and March, 773).

DATA GAPS - Need to develop methods to accurately census Washington harlequin duck populations particularly the breeding populations. Need to conduct ecological studies on their wintering and breeding habitat requirements.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 771, 907, 773.

FACT SHEET

B-29 WHITE-WINGED SCOTER

Melanitta deglandi

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor on salt water (September to May) and occasionally on nearby fresh water of Western Washington. Non-breeding birds common in summer, mostly on salt water. (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The white-winged scoter obtains its food by diving for mollusks, crustaceans and fish. It feeds and rests in waters over mud flats and open waters of large and small estuaries, protected harbors and in particular ocean waters and major entrance channels (Wahl 1976). It particularly likes quiet inshore stretches of coves or bays or just out to sea from breakers (131).

CRITICAL HABITAT AREAS - A major fall migration and winter critical concentration area was mapped:

Eighteen mile stretch of water between Willoughby and Destruction Islands - 124,000 white-winged scoters recorded in October (904).

Important areas included:

Admiralty Inlet, Saratoga Passage, Port Susan, Skagit and Padilla Bays - Winter populations of scoters ranged from 18,000 to 50,000 over a 7 year period with an annual average of 30,000 (900).

Waters around Copalis Rocks - 8,000 birds observed in October (904).

Dungeness National Wildlife Refuge - 3,200 recorded in January (773).

Carroll Island Waters - 1,400 in October (904).

San Juans National Wildlife Refuge - 1,600 in December (773).

DATA GAPS - Systematic censuses of migrating and wintering populations. Map feeding areas.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 904, 900, 773.

FACT SHEET

B-30 SURF SCOTER

Melanitta perspicillata

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter resident (mid-August to early May) on salt water, rare on fresh water in Western and Eastern Washington. Uncommon as non-breeder on salt water in summer (131, 132, Wahl and Paulson 1973). Usually occur in small groups of 20 to 50 birds but large concentrations occur during migration (Salo 1975).

HABITAT REQUIREMENTS - The surf scoter dives for molluscs, crustaceans and fish in water over tidal flats and in deeper waters. It rests and feeds in open waters of large and small estuaries, protected harbors and in particular the open waters of the ocean and major entrance channels (Wahl 1976).

CRITICAL HABITAT AREAS - A major fall migration and critical area was mapped for white-winged scoters:

Eighteen mile stretch of water between Willoughby and Destruction Bays - 40,000 counted in October (904).

Other important areas included:

Admiralty Inlet, Saratoga Passage, Port Susan, Padilla and Skagit Bays - winter populations of scoters ranged from 18,000 to 50,000 over a seven-year period with an annual average of 30,000 (900).

Waters around Copalis Rock - 2,800 birds counted in October (904).

Dungeness National Wildlife Refuge - 3,000 recorded in September (773).

San Juan Island National Wildlife Refuge - 1,200 counted in December (773).

DATA GAPS - Systematic censuses of migrating and wintering populations.

REFERENCES - 131, 132, Wahl and Paulson, 1973, Salo, 1975, Wahl, 1976, 904, 900, 773.

FACT SHEET

B-31 BLACK SCOTER

Melanitta nigra

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Uncommon migrant and winter visitor (October to April) on salt water. Occasional non-breeding individuals remain in summer (131, 132, Wahl and Paulson 1973). It appears to be more common along open coast than in Puget Sound. Large flocks are rare but as high as 300 have been counted in vicinity of Destruction Island in October, probably the peak month of fall migration. Later in November and December the flocks are smaller consisting of 10 to 30 birds. Black scoters also associate with the other scoter species to form relatively large flocks (Salo 1975).

HABITAT REQUIREMENTS - The black scoter feeds by diving for molluscs, crustaceans and fish. It rests and feeds on open waters of the ocean, major entrance channels, small and large estuaries and protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - No critical areas are mapped. It does not concentrate in large numbers, e.g., the largest numbers recorded for an area was 300 birds in October in an 18 mile stretch of water between Willoughby and Destruction Islands (904). Major usage areas overlap with those of other two scoters.

DATA GAPS - Systematically census migrating and wintering populations and map feeding areas.

REFERENCES - 131, 132, Wahl and Paulson 1973, Salo 1975, Wahl 1976, 904.

FACT SHEET

B-32 COMMON MERGANSER

Mergus merganser

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Uncommon migrant and winter visitor (late September to late May) on open water throughout the State. Tends to congregate in coastal salt water areas when fresh water habitats are frozen over and unavailable. Summer resident and breeder on lakes and rivers both east and west of the Cascades (131, 132, Wahl and Paulson 1973). Usually found in pairs or small groups of as many as 20 (Salo 1975).

HABITAT REQUIREMENTS - No critical areas are mapped. This merganser is distributed with no areas of large concentrations, (greater than 500). Some of the areas where larger than normal flocks have been sighted include 300 at Dungeness National Wildlife Refuge in September and October (773), 176 at Bellingham Bay in December and January (188), and 318 in December at Tacoma (190), 100 in Padilla Bay in December (192), 100 at Willapa National Wildlife Refuge in August, 125 at Tulalip Shores in September (911).

DATA GAPS - Systematically census wintering and migrating populations. Map areas where they congregate on salt water when fresh water is frozen over.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 773, 188, 190, 192, 911.

FACT SHEET

B-33 RED-BREASTED MERGANSER

Mergus serrator

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor (late August to mid May) on salt water and less commonly on fresh water mostly west of the Cascades. Rare spring and fall visitor to mountain lakes and uncommon spring migrant in Eastern Washington (131, 132, Wahl and Paulson 1973). Usually observed in pairs or small groups of 10 to 20 birds (Salo 1975).

HABITAT REQUIREMENTS - The red-breasted merganser feeds primarily on fish which it catches in waters over tide flats and in open waters of major entrance channels, small and large estuaries and protected harbors. It also uses sandy spits (Wahl 1976). They are often attracted to schools of spawning herring in February and March (Salo 1975).

CRITICAL HABITAT AREAS - No critical areas are mapped. This merganser is widely distributed with no areas with large concentrations. Some of the areas where larger than normal flocks have been sighted include 125 seen at Dungeness National Wildlife Refuge in April (165), 40 observed in May at Willapa National Wildlife Refuge (773), 116 at Bellingham in December-January (188), 172 in Padilla Bay in December (192) and 133 at Tacoma in December (189).

DATA GAPS - Systematically census migrating and wintering populations.

REFERENCES - 131, 132, Salo 1975, Wahl and Paulson 1973, Wahl 1976, 165, 773, 188, 192, 189.

FACT SHEET

B-34 AMERICAN COOT

Fulica americana

LIFE HISTORY - See WDG Report Salo 1975.

WASHINGTON DISTRIBUTION - Common resident on lakes, ponds and marshes at low and moderate elevations throughout the state and regular but less common migrant and winter visitor to sheltered salt water bays (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The coot primarily utilizes mudflats and open waters of large estuaries and protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - No critical areas are mapped. The coot is widely distributed with no areas of large concentrations (greater than 1,000). Some of the areas where fairly large numbers have been recorded include Bellingham Bay (827 in December-January, 188), Willapa Bay National Wildlife Refuge (500 in December, 773) and Padilla Bay (121 in December, 192).

DATA GAPS - Systematically census migrating and wintering populations.

REFERENCES - Salo 1975, 131, 132, Wahl 1976, 188, 773, 192.

FACT SHEET

B-35 PARASITIC JAEGER

Stercorarius parasiticus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (April to May) and fall (late July to December) migrant and uncommon summer non-breeding visitor on salt water along coast and in Puget Sound. Rare straggler to Eastern Washington. Usually single birds or pairs are observed (131, 132, Wahl and Paulson 1973, Wahl 1976, Salo 1975).

HABITAT REQUIREMENTS - The parasitic jaeger typically obtains food by assaulting gulls and forcing them to drop their catch or disgorge recent meals. They also pick up edible refuse floating in the water. They utilize the open waters of ocean coast, large estuaries, channels and reefs of "inside waters", sandy ocean beaches, undeveloped sandy beaches of protected waters and in particular the open waters of major entrance channels (Wahl 1976).

CRITICAL HABITAT AREAS - No critical areas are mapped. Parasitic jaeger is widely distributed and does not concentrate in large numbers in any one area. Some of the areas where several jaegers have been recorded include Grays Harbor (10 in October, Smith and Mudd 1975), San Juans National Wildlife Refuge (6 in July, 773), Westport (25 in September, 771).

DATA GAPS - Need better censusing of migrating jaegers to determine population numbers and distribution.

REFERENCES - 131, 132, Wahl and Paulson 1973, Wahl 1976, Salo 1975, Smith and Mudd 1975, 773, 771.

FACT SHEET

B-36 GLAUCOUS-WINGED GULL

Larus glaucescens

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Very common winter resident (September to May) on salt water and nearby fresh water west of the Cascades and inland. Rare along larger rivers and lakes in Eastern Washington. Summer visitor and breeder in Puget Sound, San Juans and along Washington Coast from Copalis north. Nonbreeding birds, commonly seen on salt water in summer (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The omniverous glaucous-winged gull feeds in a variety of habitats. Large numbers often congregate at garbage dumps in winter, e.g. 5,000 at Everett (Salo 1975). It rests and feeds along rocky ocean beaches, rocky islands, rocky beaches of protected waters. It also inhabits sandy ocean beaches, sandy islands, sandy beaches of protected waters, sandy spits and tideflats. It also feeds in kelp beds and eelgrass. It is particularly common in open waters of ocean coast, major entrance channels, protected harbors and near ocean jetties. It nests on rocks, rocky islands and sandy islands. The nests are usually well above the high tide mark (Wahl 1976, 867).

CRITICAL HABITAT AREAS - Critical areas mapped are the locations of large nesting colonies. These include several islands in the Washington Islands National Wildlife Refuge with estimates of peak production from 1970-1974:

Destruction Island - Peak production of 210 young (904),

Alexander Rock - Peak production of 460 (904),

Quillayute Needles - Peak production of 240 (904),

James Island - Peak production of 110 (904),

Cake Rock - Peak production of 900 (904),

Carroll Island - Peak production of 2,575 (904),

Bald Island - Peak production of 340 (904),

White Rock - Peak production of 110 (904),

Bodelteh Islands - Peak production of 1,150 (904),

Spike Rock - Peak production of 100 (904),

Tatoosh Island - Approximately 2,500 nesting pairs (Welch 1976).

Two islands in Grays Harbor:

Goose Island - Approximately 280 nesting pairs plus 920 pair of integrades between Western and Glaucous-winged gulls (Smith and Mudd 1975),

Sand Island - 112 nesting pair plus 369 pair of Western Glaucous-winged gull integrades (Smith and Mudd 1975).

Two islands in Strait of Juan de Fuca:

Protection Island - Approximately 3,000 nesting pairs, largest single colony of inside waters in Washington (Wahl 1976),

Minor Island - 175 nesting birds (907).

Several islands in San Juan Archipelago including:

Puffin Island - 600 nesting birds (907),

Gull Rock - 300 nesting birds, (907),

Bare Island - 200 nesting birds (907),

Low Island - 150 nesting birds (907),

Daughter Rock - 300 nesting birds (907),

San Juan Islands National Wildlife Refuge - 13,000 young produced (773).

Colville Island - 1,486 nests (180),

Bird Rocks - 575 nests (180),

Williamison Rocks - 301 nests (180),

Flower Island - 136 nests (180),

Hall Island - 550 nesting birds (907),

Viti Rocks - large colony (912)

Sandy Island of north end of Swinomish Channel - nesting population of 600-700 pairs (Wahl 1976).

DATA GAPS - Need annual censusing of breeding colonies and ecological studies of breeding sites. Eaton (1975) felt that a full scale ecological study on gull populations in Washington was needed.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 867, 904, Welch 1976, Smith and Mudd 1975, 907, 773, 180, 912, Wahl 1975, Eaton 1975.

FACT SHEET

B-37 WESTERN GULL

Larus occidentalis

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common permanent resident and breeder along the ocean coast from Destruction Island south. Migrant and winter visitor elsewhere on salt water and nearby fresh water. Infrequent inhabitant of Puget Sound. Straggler in Eastern Washington (131, 132, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The western gull uses a wide variety of habitats including sandy ocean beaches, sandy islands, sandy beaches of protected waters, sandy spits, rocky ocean beaches, rocky islands, rocky beaches of protected waters, jetties, tideflats, eelgrass and kelp beds and open waters of ocean coast, major entrance channels, reefs and channels of inside waters, small and large estuaries and protected harbors. The western gull nests on rocks, rocky islands and sandy islands (Wahl 1976, 132).

CRITICAL HABITAT AREAS - Critical habitat areas are mapped are mainly large breeding colony sites. The following areas in Washington Islands National Wildlife Refuge are included with peak production estimates for

these areas recorded from 1970-1974 (904).

Grenville Islands and Arch - Peak production of 390 (904),

Split Rock - Peak production of 630 (904),

Willoughby Rock - Peak production of 650 (904),

Destruction Island - Peak production of 600 (904).

In addition there are two Islands in Grays Harbor:

Goose Island - 800 breeding pairs of western gulls and 920 breeding pairs of western gull-glaucous-winged gull intergrades (Smith and Mudd, 1975), gull nesting colony on coasts of Oregon and Washington south of Cape Flattery (Smith and Mudd, 1975).

Sand Island - 320 breeding pairs of western gulls and 369 pair of western gull-glaucous-winged gull intergrades (Smith and Mudd, 1975),

Columbia River Estuary near Lewis-Clark National Wildlife Refuge - has large migrating populations of 150,000 gulls with 60 percent being western and herring gulls (Welch 1976).

DATA GAPS - Need annual censusing of breeding colonies and ecological studies of breeding sites.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 904, Smith and Mudd 1975, Welch 1976.

FACT SHEET

B-38 HERRING GULL

Larus argentatus

LIFE HISTORY - See WDG Report Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor in Washington chiefly on the west side of the Cascades in both fresh water and salt water. Occasionally found on lakes and rivers of Eastern Washington from September to mid-May. Most abundant during migration (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The herring gull utilizes a wide variety of habitats including sandy ocean beaches, sandy islands, sandy beaches of protected waters, sandy spits, rocky ocean beaches, rocky islands, rocky beaches of protected waters, jetties, tideflats, eelgrass and kelp beds and open waters of the ocean coast, major entrance channels, large and small estuaries, and protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - Major fall and winter concentration areas have been noted. The following areas in the Washington Islands National Wildlife Refuge are included; peak population estimates for 1970-1974 period are given. Waters Surrounding Grenville Point Area - 60,000 in October (904), Total Washington Islands National Wildlife Refuge - 200,000 in August, 100,000

in October and 77,000 in April (773). Other areas include: San Juan Island National Wildlife Refuge - 14,000 in April and May and 2,000 in August (773). No specific locations mapped . Willapa National Wildlife Refuge - 2,000 in February (773), Columbia River Estuary near Lewis-Clark National Wildlife Refuge - peak migration populations of 150,000 gulls with 60 percent being western and herring gulls (Welch 1976). No critical areas are mapped.

DATA GAPS - Need annual censusing of fall, winter and spring populations throughout salt water areas.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 904, 773, Welch 1976.

FACT SHEET

B-39 CALIFORNIA GULL

Larus californicus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant on salt water and inland fresh water. Uncommon winter visitor and non-breeding summer visitor in salt water. Uncommon summer visitor and breeder and rare winter visitor in Eastern Washington (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The California gull feeds and rests in many different habitat types including sandy ocean beaches, sandy islands, sandy beaches of protected waters, sandy spits, rocky ocean beaches, rocky islands, rocky beaches of protected waters, jetties, tideflats, eelgrass and kelp beds and open waters of the ocean coast, major entrance channels, large and small estuaries and protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - No specific areas were mapped. Recorded important migration concentration areas include: Willapa Bay National Wildlife Refuge - 5,000 in August (773), Off Westport in Coastal Waters - 1,000 in September, 13,000 in October (771).

DATA GAPS - Need annual censuses of fall and spring migration populations throughout salt water habitats.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976, 773, 771.

FACT SHEET

B-40 RING BILLED GULL

Larus delawarensis

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and uncommon winter visitor in salt water habitat. Common migrant and winter visitor in fresh water habitats. Breeds in scattered colonies on islands in rivers, lakes and ponds of Eastern Washington but uncommon summer visitor in areas west of the Cascades (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The ring-billed gull occurs in several different habitat types including sandy ocean beaches, sandy islands, sandy spits, sandy undeveloped beaches of protected waters, open water of channels and reefs of inside waters, large and small estuaries and protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - No specific critical areas mapped. Some of the recorded important migration concentration areas include: Washington Islands National Wildlife Refuge - 1,000 in October and 300 in March (773), Willapa Bay National Wildlife Refuge - 800 in August, 300 in December, 200 in March (773), San Juan Islands and vicinity - very common - hundreds of migrants (774), San Juan Islands National Wildlife Refuge - 300 in April (773).

DATA GAPS - Systematic censusing of migrating populations.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Wahl 1976, 773, 774.

FACT SHEET

B-41 MEW GULL

Larus canus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring and fall migrant and winter visitor (August to May) on salt water and nearby fresh water west of the Cascades. Uncommon as a summer non-breeder. Very common in Puget Sound in winter. Rare in migration along rivers in Eastern Washington, principally during the fall (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The mew gull inhabits sandy ocean beaches, sandy islands, sandy spits, undeveloped sandy beaches of protected waters, jetties, rocky beaches, rocky islands, tideflats, eelgrass and kelp beds, and open waters of inside water reefs and channels, large and small estuaries and protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - No specific critical areas have been mapped. Abundant and widely distributed throughout area. Some of the recorded migration and winter concentration areas include Willapa Bay National Wildlife Refuge 1,000 in March and 300 in December, 773), Washington Islands National Wildlife Refuge (9,000 in October and 1,000 in March 773). Waters in vicinity of Grenville Island (300, in October, 904) San Juans National Wildlife Refuge (1,600 in May and 700 in March, 773).

Padilla Bay (300 in December, 192), Bellingham Bay (532 in December-January, 188), Tacoma area (775 in December, 189), Seattle-Elliott Bay area (1,189 in December, 190).

DATA GAPS - Systematic censuses of migrating and winter populations.

REFERENCES - 131, 132, Wahl and Paulson 1973, Salo 1975, Wahl 1976, 773, 904, 192, 188, 189, 190.

FACT SHEET

B-42 BONAPARTE'S GULL

Larus philadelphia

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter visitor in salt water and nearby fresh water west of the Cascades; few non-breeders occur in summer. Scattered migrant and possible breeder in the interior of Eastern Washington (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The Bonaparte's gull inhabits sandy ocean beaches, sandy islands, undeveloped "inside water" sandy beaches, sandy spits, tideflats, open ocean waters and open waters of the channels and reefs of "inside waters", small and large estuaries and protected harbors. Not usually found offshore beyond the littoral zone (Wahl 1976).

CRITICAL HABITAT AREAS - No specific critical areas have been mapped. Some of the recorded migration and winter concentration areas include Washington Islands National Wildlife Refuge (10,000 in September and 1,500 in May, 773), Willapa Bay National Wildlife Refuge (2,000 in December and 1,600 in April, 773), Westport (1,939 in July, 912), Dungeness Bay and Spit (400 in August, 771), San Juan Islands National Wildlife Refuge (15,000 in August, 773), Padilla Bay (420 in December, 192), Bellingham Bay (511 in January, 188), Tacoma area waters (1,224 in December, 189).

DATA GAPS - Migration and winter population censuses needed.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 773, 912, 771, 192, 188, 189.

FACT SHEET

B-43 HEERMANN'S GULL

Larus heermanni

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common summer (non-breeding) and fall visitor (July to November) on salt water mostly along the ocean coast, the Straits of Juan de Fuca, the San Juan Islands, south in Hood Canal to Port Gamble and in Puget Sound to Kingston (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The Heermann's gull inhabits sandy ocean beaches, sandy islands, sandy spits, sandy undeveloped beaches, tideflats, rocky ocean beaches, rocky islands, jetties, open ocean waters and open waters of major entrance channels, inside water channels and reefs and small estuaries (Wahl 1976).

CRITICAL HABITAT AREAS - No specific critical areas have been mapped. Major recorded concentration areas include Willapa Bay National Wildlife Refuge (1,000 in August, 773), Washington Islands National Wildlife Refuge (800 in August, 773), Cape Flattery and Tatoosh Island (670 in July, 185), LaPush (150 in July, 771), San Juan Islands National Wildlife Refuge (300 in November, 773).

DATA GAPS - Need annual censusing of summer and fall populations throughout coastal waters.

REFERENCES - 131, 132, Wahl and Paulson 1973, 773, 185, 771.

FACT SHEET

B-44 THAYER'S GULL

Larus thayeri

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Migrant and winter visitor west of the Cascades on both fresh and salt water. (131, 132, Wahl and Paulson (1973).

HABITAT REQUIREMENTS - The Thayer's gull utilizes sandy ocean beaches, sandy islands, sandy spits, undeveloped sandy beaches in "inside waters", tideflats, eelgrass beds, kelp beds, rocky islands, jetties, open waters of major entrance channels, "inside waters" of reefs and channels, large and small estuaries, and protected harbors. The primary habitat areas are the channels and reefs of "inside waters" (Wahl 1976).

CRITICAL HABITAT AREAS - No critical areas have been mapped. Species is widely distributed with no major concentration areas. One of the larger concentrations recorded was 29 at Bellingham in December (188).

DATA GAPS - Systematic censuses of migration and winter populations.

REFERENCES - 131, 132, Salo 1975, Wahl and Paulson 1973, Wahl 1976, 188.

FACT SHEET

B-45 COMMON TERN

Sterna hirundo

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common migrant along salt water and nearby fresh water west of the Cascades. Rare spring and uncommon fall migrant in Eastern Washington (131). Spring migration appears to be rapid and follows primarily the open coast. The peak month of fall migration appears to be September. The largest flocks have been seen on the coast and in Strait of Juan de Fuca (Salo 1975).

HABITAT REQUIREMENTS - The common tern inhabits sandy ocean beaches, sandy islands, sandy spits, undeveloped sandy beaches of "inside waters", tidalflats, open ocean waters and open waters of major entrance channels, channels and reefs of protected inside waters and large and small estuaries (Wahl 1976). The common tern feeds by diving from the air and capturing small fish (Salo 1975).

CRITICAL HABITAT AREAS - No specific critical areas have been mapped. The tern is a common and widely distributed migrant. Areas where the larger flocks have been observed include Westport [250 - 1000 birds in May, (771)], Dungeness Bay and Spit [250 in August, (771)] and Cypress Island, 2 mile

stretch of coast from Strawberry Bay to Tide Point [over 90, (774)].

DATA GAPS - Systematic census of migration populations and ecological studies on use of coastal waters.

REFERENCES - 131, Salo 1975, Wahl 1976, 771, 774.

FACT SHEET

B-46 COMMON MURRE

Uria aalge

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common permanent resident on salt water, breeding on islets along the ocean coast and in San Juan Archipelago. Less numerous in winter along coast but more common at that season in Puget Sound (October to May). Disperses over a wide area of continental shelf and into Puget Sound in winter (131, Wahl 1976, Salo 1975).

HABITAT REQUIREMENTS - Common murres nest in dense colonies on rocky islands, particularly ledges of steep cliffs. They feed on pelagic fish eg. smelt, anchovy, sandlance, in ocean waters (734), and open waters of major entrance channels, channels and reefs of protected inside waters and protected harbors (Wahl 1976).

CRITICAL HABITAT AREAS - Major nesting sites are mapped and include several islands in Washington Islands National Wildlife Refuge. Population estimates are peak number for period 1970 - 1974. These include:

Grenville Islands and Arch - (peak production estimate of 3,800, (904),

Flat Rock - 600 breeding birds in May-June, (904),

Split Rock - peak production of 2,080, (904),

Destruction Island - 600 breeding birds in May-June, (904),

Quillayute Needles - peak production of 790, (904),

James Island - peak production of 600, (904),

Cake Rock - 600 breeding birds in May-June, (904),

White Rock - 500 breeding birds in May-June, (904),

Willoughby Rock - peak production of 2,700, (904),

Another critical nesting area on outer coast is:

Tatoosh Island - which has approximately 100 - 200 nesting pairs (Welch 1976, 185).

During spring, summer, fall and winter many areas of the coast, i.e., Willapa Bay and Grays Harbor, major entrance channels and channels, and reefs of "inside waters" of Puget Sound are important feeding areas for adults and young. Some of the areas where large numbers have been recorded include Grays Harbor (3,013 at mouth of harbor in August, Smith and Mudd, 1975), Willapa Bay National Wildlife Refuge (7,000 in May, 4,000 in August, 200 in February, 773), 550 near Cape Flattery in July, 185), La Push (1,000 in July, 771), San Juan Islands National Wildlife Refuge and nearby waters (1,350 in March, 900 in October, 773), two-mile stretch of coast from Strawberry Bay to Tide Point, Cypress Island very common, hundreds from October to April (774), Rosario Strait very common from October to April (774), Padilla Bay (640 in December, 192), and Guemes Channel (Wahl 1976).

DATA GAPS - Need annual census of breeding populations and wintering areas. Mapping and ecological studies of feeding areas.

REFERENCES - 131, Salo 1975, Wahl 1976, 734, 904, Welch 1976, 185, Smith and Mudd, 1975, 773, 771, 774, 192.

FACT SHEET

B-47 PIGEON GUILLEMOT

Cepphus columba

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common permanent resident on salt water, breeding in suitable locations along the ocean coast and in Puget Sound. It is usually seen singly or in pairs in open waters (131, Wahl and Paulson 1973, Wahl 1976). It breeds on several islands in Washington Islands National Wildlife Refuge in the San Juan Archipelago and in several suitable locations in southern Puget Sound (Salo 1975).

HABITAT REQUIREMENTS - Pigeon guillemots nest in burrows in a clay bank, a rock crevice in a high cliff and even under logs on beaches often close to human activity (Salo 1975, Wahl 1976). Nests are often found on rocky islands. Thes nests may be near the water or up to 200 feet above the sea level (734). It feeds primarily on fish, examples being blennies, sculpins, sandlance, smelt and lamprey. Feeding areas include open waters of major entrance channels, reefs and channels of "inside waters" and protected harbors (Wahl 1976). It has also been observed feeding in kelp beds and in waters in the vicinity of sand spits, gravel spits and jetties.

CRITICAL HABITAT AREAS - The pigeon guillemot is not generally a colonial nester but breeds in loose groups and scattered pairs on many offshore rocks and island cliffs. Thus there are no areas with real large numbers of guillemots nesting. No areas have been mapped but some of the areas where nesting populations have been observed include the following islands in Washington Islands National Wildlife Refuge; a Grenville Arch, production of 4 (904), Split Rock peak production of 7 (904), Destruction Island peak production of 5 (904), James Island peak production of 10, Cake Rock 25 birds in June, (904), Bodeleth Islands peak production of 5, (904). Other nesting areas along Washington Coast and Strait of Juan de Fuca include jetties at mouth of Grays Harbor (Wahl 1976), Tatoosh Island, 40 breeding birds in June-July, (907), Smith Island, over 100 breeding birds in May, (907) and Protection Island 50 breeding birds in June-July, (907).

Some of the nesting islands in San Juans include Flower Island, 255 adults and young in August, (Hocutt 1976), Williamson Rocks, 125 adults and young in August, (Hocutt 1976), Castle Rock, 125 adults and young in August, (Hocutt 1976), Skipjack 165 adults and young in August, (Hocutt 1976), Bird Rocks and Colville Island. Nesting sites have also been reported near Seattle's Elliott Bay, Vashon Island, Fox Island and Hood Head (Salo 1975).

DATA GAPS - Systematic censuses of breeding populations. Map feeding areas.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976, Salo 1975, 734, 904, 907, Smith 1976, Hocutt 1976, 164.

FACT SHEET

B-48 MARBLED MURRELET

Brachyramphus marmoratus

LIFE HISTORY - See WDG Reports, Salo 1975, Eaton 1975.

WASHINGTON DISTRIBUTION - Common migrant and winter resident (September to April) on salt water. Less common in summer; probably breeds in burrows and trees in upland areas of Western Washington but no nesting record as yet (131, Wahl and Paulson 1973, Salo 1975). The marbled murrelet is generally widely scattered and usually seen in pairs or loose small flocks of less than 50 birds (Salo 1975), Eaton 1975).

HABITAT REQUIREMENTS - The marbled murrelet seems to prefer the inner coastal waters. Primary habitats include the open waters of major entrance channels, channels and reefs of "inside waters", large estuaries and protected habors (Wahl 1976). It is an inshore feeder eating primarily fish such as sand lance and sea perch. (Salo 1975).

CRITICAL HABITAT AREAS - No specific critical areas have been mapped since the murrelet is widely distributed in small flocks with no areas of large concentrations. Examples of areas with some of larger counts include 4,000 in August in entire Washington Islands National Wildlife Refuge (773), 600 in San Juan Islands National Wildlife Refuge in July (773), and 144 in Padilla Bay in

December (192) and several in Guemes Channel (Wahl 1976).

DATA GAPS - Systematic census of coastal and estuarine areas. Investigate interrelationships of nesting sites and salt water feeding and brooding areas.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Eaton 1975, Wahl 1976, 773, 192.

FACT SHEET

B-49 CASSIN'S AUKLET

Ptychoramphus aleuticus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common summer resident and breeder on rocky islets off coast. Found at other seasons offshore in the open sea. Uncommon in winter in Puget Sound (131, 132, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The Cassin's auklet breeds on rocks and islands offshore. It nests in burrows in soft soil or in rock crevices from the ocean spray up to as high as 300 feet above sea level (754, 131, Wahl 1976). It feeds in open ocean waters moving farther out over continetal shelf in winter (Wahl 1976).

CRITICAL HABITAT AREAS - Major breeding colonies mapped as critical include:

Destruction Island - 100 adults in May-June, (904)

Carroll Island - 20 young produced (904)

Tatoosh Island - 20 pairs nesting (Welch 1976),

San Juan Islands National Wildlife Refuge - production of 30 young (773).

DATA GAPS - Systematic census of breeding colonies, particularly breeding colonies in San Juan Islands.

REFERENCES - Salo 1975, 131, 132, Wahl and Paulson 1973, 754, Wahl 1976, 904, 773.

FACT SHEET

B-50 RHINOCEROS AUKLET

Cerorhinca monocerata

LIFE HISTORY - See WDG Reports, Salo 1975, Eaton 1975.

WASHINGTON DISTRIBUTION - Common summer resident along northwest coast of Washington, in the Strait of Juan de Fuca and northern Puget Sound area, breeding on offshore islands of coast and Strait of Juan de Fuca. Non-breeding summer visitors all along coast. Common migrant and uncommon winter resident (late December to April) on salt water along coast and in Puget Sound (131, 132, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The rhinoceros auklets nest in deep burrows usually in steep banks of the shoreline of rocky islands. On Protection Island auklets prefer grassy slopes and nest occasionally as far as 200 yards from the bluffs (748). On Destruction Island the birds prefer brushy vegetation containing salal, salmonberry and willows and do not nest farther than 10 feet from bluff edges (840). Soil for burrows must not be too loose and sandy, nor too hard or rocky. Few of the Washington Islands possess suitable nesting habitat. The burrows are used from approximately May through July and early August when the young fledge (840). Breeding pairs appear to return to the same burrows annually.

Descriptions of specific feeding habitat requirements are lacking. They do feed in ocean waters, open waters of large estuaries, and in particular, open waters of major entrance channels and reefs and channels of "inside waters" (Wahl 1976). Large numbers have been observed feeding north and east of Smith and Protection Island (Manual 1973, in Eaton 1975) and in entrance channel to Grays Harbor (Smith and Mudd 1975). Fish is the major food source with some of the more important species being anchovy, sand lance; herring and smelt (840). Sand lance is consumed heavily by chicks (748).

CRITICAL HABITAT AREAS - The major breeding colonies have been mapped as critical and include:

Destruction Island - Breeding population estimates for 1974 of 13,800 adults with 5,240 young produced (904) and another estimate of 17,400 breeding adults in 1974 (840).

Protection Island - Estimated breeding population of 18,400 in 1973 (907). Largest rhinoceros auklet breeding colony south of Alaska (Wahl 1976).

Smith Islands - Estimated breeding colony of 700 in 1973 (907) and 1,600 in 1974 (Manual and Leschner 1974, in Eaton 1975).

In addition to breeding islands, there are several feeding areas that are important, particularly during breeding period. Some of the major ones include Admiralty Inlet (hundreds seen in May and June, 774), Discovery Bay (Wahl, 1976), Deception Pass (250 in August, 771), Dungeness Bay (500 in July, 771), channels in San Juan Islands National Wildlife Refuge (3,000 in July, 773), San Juan Channel (500 in July, 907), large numbers north of Smith and Protection Island (Manual, 1973, in Eaton, 1975), and hundreds in entrance channel of Grays Harbor (Smith and Mudd, 1975).

DATA GAPS - Systematic census of breeding colonies, investigate Tatoosh Island for possible breeding colony (907) and census major entrance channels, reefs, and channels of "inside waters" for feeding populations. Also need ecological studies of feeding sites.

REFERENCES - Salo 1975, 131, Eaton 1975, 132, Wahl and Paulson 1973, Wahl 1976, 840, 748, Manual 1973, in Eaton 1975, Smith and Mudd 1975, 904, 907, Manual and Lescher 1974, in Eaton 1975, 774, 771, 773.

FACT SHEET

B-51 TUFTED PUFFIN

Lunda cirrhata

LIFE HISTORY - See WDG Reports, Salo 1975, Eaton 1975.

WASHINGTON DISTRIBUTION - Common local summer resident and breeder on rocks and headlands along the ocean coast and less commonly in the San Juan Islands and Strait of Juan de Fuca. Uncommon winter visitor on salt water along the ocean coast and less commonly on inland marine waters being rare in Puget Sound. Usually far offshore over continental shelf in winter (131, 132, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The puffin breeds in Washington on those rocky islands where there is sufficient soil cover for burrow building. They nest in burrows in grassy or bare soil on steep banks. Washington provides suboptimal habitat since puffins appear to prefer nesting areas near very deep water, which does not exist in Washington's coastal region (Sanger 1974 in Eaton 1975). The puffin feeds primarily on smelt, sardines, herring, other small fishes, sea urchins, molluscs, squid, and amphipods (132). Their primary feeding areas are ocean waters and major entrance channels (Wahl 1976).

CRITICAL HABITAT AREAS - Major nesting colonies that occur in Washington Islands National Wildlife Refuge have been mapped as critical. The following

are peak production estimates of several of the islands for 1970 to 1974 year period:

Destruction Island - peak production of 500 (904), 400 nesting pairs in 1973 (907).

Grenville Islands - peak production of 40 (904)

Willoughby Rock - peak production of 20 (904)

Alexander Rock - peak production of 1,470 (904)

Quillayute Needles - peak production of 325 (904)

Cake Rock - peak production of 875 (904)

Carroll Island - peak production of 2,225 (904)

Bald Island - peak production of 700 (904)

White Rock - peak production of 175 (904)

Bodelteh Islands - peak production of 700 (904)

Spike Rock - peak production of 45 (904).

In addition 60 to 70 puffins nested on Protection Island in 1973 (907), 60 puffins nested on Tatoosh Island in 1973 and 49 nests were found on Puffin Rock south of Point Grenville (907).

The puffin's nesting status in the San Juan Islands is unknown. There have been reports of nesting, 40 young produced in the San Juan National Wildlife Refuge in recent years (773).

DATA GAPS - Systematic census of breeding colonies. Investigate areas used in past by nesting puffins, particularly San Juan Islands, to determine why puffins are not breeding at present. Map feeding areas.

REFERENCES - Salo 1975, Eaton 1975, 131, 132, Wahl and Paulson 1973, Wahl 1976, 904, 773, Sanger 1974 in Eaton 1975.

FACT SHEET

B-52 WILSON'S PHALAROPE

Steganopus tricolor

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common local summer resident and breeder on ponds and marshes in arid interior of Eastern Washington. Uncommon to rare migrant (March to April, July to late November) west of the Cascades. Nesting records for Western Washington are from Tacoma tide flats (in 1934 before filling in most of the flats), two separate locations near Grays Harbor and possible nesting observation from Keystone, Whidbey Island (Salo 1975, 132, Wahl and Paulson 1973, 131).

HABITAT REQUIREMENTS - The Wilson's phalarope feeds on insects and their larvae by walking, wading and whirling in shallow water to stir up food. They feed in tideflats and also fine sediment shorelines of large estuaries (Wahl 1976).

CRITICAL HABITAT AREAS - No areas have been mapped due to wide distribution and lack of recorded migration concentration areas. Protection of mudflat feeding areas will be needed to maintain populations in the State.

DATA GAPS - Systematic census of migration populations and distribution in coastal and estuarine areas.

REFERENCES - 131, Salo 1975, 132, Wahl and Paulson 1973, Wahl 1976.

FACT SHEET

B-53 NORTHERN PHALAROPE

Lobipes lobatus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring and fall migrant through the non-mountainous parts of the State, being most abundant on salt water along the coast and Puget Sound. Large flocks of 1,000 and 1,500 are regularly reported along the coast during the peak months of migration, May and August (Salo 1975). Increasing in numbers as migrant and possibly summer visitor in Eastern Washington reservoir and lake areas (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The northern phalarope picks its food from the surface of the water. In shallow water phalaropes whirl to stir up food items. Diet consists mainly of insects but also includes small crustaceans, marine worms, small molluscs, small fish and plant matter (Salo 1975). Their feeding habitats include tideflats, fine sediment shorelines of large and small estuaries and salt marsh. Resting areas include open waters of major entrance channels, channels and reefs of "inside waters" and in particular, ocean waters (Wahl 1976).

CRITICAL HABITAT AREAS - No critical areas have been mapped, but large numbers have been recorded in these general areas; coastal waters off Westport (1,350 in May, 771), Cape Flattery waters (1,500 in May, 771), Washington Islands National Wildlife Refuge (1,200 in May, 1,500 in October, 773), and San Juan Islands National Wildlife Refuge (17,000 in May and 10,000 in August, 773).

DATA GAPS - Systematic censuses of migrating populations and distribution.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976, Salo 1975, 771, 773.

FACT SHEET

B-54 GREAT BLUE HERON

Ardea herodias

LIFE HISTORY - See WDG Report (Salo 1975).

WASHINGTON DISTRIBUTION - Common permanent resident and breeder on lakes, rivers, along salt water and on marshes in Western Washington. Occasional summer and fall visitor to rivers and lakes in mountains. Common migrant and summer resident in Eastern Washington and some wintering along larger unfrozen rivers (131, Wahl and Paulson 1973, Wahl 1976). There are numerous observations in greater Puget Sound region, in bays and harbors of coast and even on the open coast. Except in nesting colony areas they are generally sighted singly or in small groups.

HABITAT REQUIREMENTS - The great blue heron nest as colonies in tall trees generally near water. Their nests are large masses of sticks. The heron feeds on a variety of animal matter including fish, insects, crustaceans and other aquatic life. Its feeding areas are numerous and include rocky and sandy ocean beaches, shallow waters of "inside water" channels and reefs, rocky and sandy islands, tideflats, shallow waters of large and small estuaries, protected waters of Puget Sound, salt marsh, waters along sandy spits and jetties, and sandy and rocky undeveloped "inside water" beaches (Wahl 1976).

CRITICAL HABITAT AREAS - Critical habitat areas mapped are those known nesting colony sites. These mapped areas (underlined) and unmapped general nesting locations include: Samish Island (106 to 200 pairs, Jeffrey, 1976), Coronet Bay (numbers unknown, Adkins, 1976), Ika Island (numbers unknown, Adkins, 1976), Willapa Bay (75 young produced in 1974, 773), Bolton and Tahuya Peninsula of Hood Canal (Yoshinaka and Ellifrit, 1974), Bainbridge Island, Camano Island near Port Gamble (Salo, 1975), Indian Island and Admiralty Inlet (905), and Karlson Island in Columbia River estuary (150 breeding birds and appear to be increasing, Welch, 1976).

Feeding areas in tidal flats and estuaries near the rookeries are vital to survival of adults and young in summer and winter. These include areas such as Willapa Bay (185 in June, 220 in December, 773), Grays Harbor (240 in December and 144 in August, Smith and Mudd, 1975), Padilla Bay (103 in December, 192), 55 in Bellingham Bay in December, 188), Eglin Bay (40 throughout the year, 903).

DATA GAPS - Systematically census and map locations of rookeries near salt water.

REFERENCES - 131, Wahl and Paulson, 1973, Wahl, 1976, Jeffrey, 1976, Adkins, 1976, 773, Yoshinaka and Ellifrit, 1974, Salo, 1975, 905, Welch, 1976, Smith and Mudd, 1975, 192, 188, 903.

FACT SHEET

B-55 WHIMBREL

Numenius phaeopus

LIFE HISTORY - See WDG Report (Salo 1975).

WASHINGTON DISTRIBUTION - Common spring (April to June) and fall migrant (August to October) along the ocean coast and Puget Sound, preferring tideflats and spits along salt water. Rare migrant east of the Cascades (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The whimbrel feeds primarily on small crustaceans, marine worms, molluscs and insects. In the fall it appears to feed more by salt water sloughs and in the spring more on ocean beaches, feeding among the logs and debris at high tide mark (131). The primary habitats utilized by the whimbrel are sandy ocean beaches, tidalflats, large estuary shorelines, salt marsh, sandy spits, and sandy undeveloped beaches of "inside waters" (Wahl 1976).

CRITICAL HABITAT AREAS - General areas where large numbers of migrating whimbrels have been recorded include Willapa Bay National Wildlife Refuge 710 in May (773), San Juan Islands National Wildlife Refuge,170 in May (773), Washington Islands National Wildlife Refuge,100 in May (773), and Grays Harbor,50 in June (Smith and Mudd 1975). No critical areas were mapped.

DATA GAPS - Systematic census of migrating population numbers and map feeding areas.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976, 773, Smith and Mudd 1975.

FACT SHEET

B-56 SPOTTED SANDPIPER

Actitis macularia

LIFE HISTORY - See WDG Report (Salo 1975).

WASHINGTON DISTRIBUTION - Common spring and fall migrant, summer resident (late April to October) and common winter resident (west of Cascades) along fresh water. Uncommon migrant and winter resident and rare summer resident along salt water. Breeds along rivers, larger streams and lakes from sea level to alpine regions (131, Wahl 1976, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The spotted sandpiper utilizes rock and mixed coarse beaches along the ocean coast, along large and small estuaries and along inside protected waters. It also utilizes sandy spits (Wahl, 1976).

CRITICAL HABITAT AREAS - Due to wide distribution and abundance in salt and fresh water no critical areas have been mapped. Areas where some of the larger concentrations have been observed include Washington Islands National Wildlife Refuge [55 in June (773)], Willapa National Wildlife Refuge [50 in September (773)], and in the San Juan Islands (Richardson, 1975 in Salo, 1975).

DATA GAPS - Systematic census of migrating and winter populations and map feeding areas.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976, 773, Salo 1975; Richardson 1975 in Salo 1975.

FACT SHEET

B-57 WANDERING TATTLER

Heteroscelus incanus

LIFE HISTORY - See WDG Report (Salo 1975).

WASHINGTON DISTRIBUTION - Common spring (May) and early fall migrant (July to September), uncommon late fall migrant and rare winter visitor on rocky beaches along salt water, mostly along the ocean coast. Rare non-breeding summer visitor on salt water (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The wandering tattler feeds and rests along rocky and mixed coarse beaches and in particular ocean jetties (131, Wahl 1976). Its diet is primarily small molluscs, crustaceans, marine worms and insects (Bent 1929 in Salo 1975).

CRITICAL HABITAT AREAS - Areas mapped as important are areas where larger concentrations have been observed. These include rock habitats at mouth of Columbia River, near Cape Disappointment, North Head, Columbia River Channel, Peacock Spit and Jetty (Wahl 1976), rocky shorelines in Washington Islands National Wildlife Refuge, particularly near Pt. Grenville, Copalis Rocks, Destruction Island, Quillayute Needles, and Flattery Rocks [400 in May and 300 in October (773) (Wahl 1976)], area near mouth of Grays Harbor particularly near south jetty and groins to Pt. Chehalis and Pt. Brown jetty (Wahl 1976).

Migrating wandering tattlers have also been described in the dozens in the vicinity of San Juan Island (774) and in San Juan Island National Wildlife Refuge [60 in May (773)].

No critical areas are mapped.

DATA GAPS - Systematic census of migrating and wintering populations, particularly the San Juan Islands are where data is somewhat contradictory.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Wahl 1976, Bent 1929 in Salo 1975, 773, 774.

FACT SHEET

B-58 GREATER YELLOWLEGS

Tringa melanoleuca

LIFE HISTORY - See WDG Report (Salo 1975).

WASHINGTON DISTRIBUTION - Common spring (April to June) and fall (late July to November) migrant and rare winter visitor on salt water flats and along fresh water. It is less common east of Cascades (131, Wahl and Paulson 1973). The birds are normally seen singly or in small flocks of 5 to 10 birds with large flocks, 10 or more being rare.

HABITAT REQUIREMENTS - The greater yellowlegs feeds and rests along mud-flats, salt marshes, sandy spits, undeveloped sandy beaches of "inside waters" and shorelines of small and large estuaries (Wahl 1976). It feeds primarily on small fish, crustaceans, insects and their larvae (132).

CRITICAL HABITAT AREAS - Due to wide distribution in small numbers no critical areas have been mapped. Two areas where relatively large numbers have been recorded include vicinity of San Juan Islands [dozens of migrants (773)], and Cypress Island [100's in a 2 mile area of coast from Strawberry Bay to Tide Point (774)].

DATA GAPS - Systematically census migrating and wintering populations. Particularly look at San Juans Archipelago.

REFERENCES - 131, Wahl and Paulson 1973, 132, Wahl 1976, 774.

FACT SHEET

B-59 LESSER YELLOWLEGS

Tringa flavipes

LIFE HISTORY - is contained below.

WASHINGTON DISTRIBUTION - Common fall migrant (early July to late October) along salt and fresh water at low elevations throughout Washington; uncommon spring migrant (April - May), mostly west of the Cascades, a few in summer. Uncommon-rare winter visitor in suitable habitats along salt water (131, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The lesser yellowlegs feeds and rests along mudflats, salt marshes, sandy spits, undeveloped sandy beaches of "inside waters" and shorelines of small and large estuaries (Wahl 1976). It feeds primarily on small fish, crustaceans, insects and their larvae.

CRITICAL HABITAT AREAS - Due to wide distribution in small flocks no critical areas have been mapped.

DATA GAPS - Systematically census migrating and wintering populations.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976.

FACT SHEET

B-60 RED KNOT

Calidris canutus

LIFE HISTORY - See WDG Report (Salo 1975).

WASHINGTON DISTRIBUTION - Common spring (May) and less common fall (August to October) migrant on beaches along the ocean coast; rare on inland salt water. Irregular winter visitor and rare fall migrant in Eastern Washington (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The red knot rests and feeds along sandy ocean beaches and in particular tideflats and fine sediment areas along shorelines of large estuaries (Wahl 1976). The red knot probes the beaches and tideflats for small molluscs, crustaceans and marine insects (Salo 1975).

CRITICAL HABITAT AREAS - Major concentration areas of migrating populations have been mapped as critical areas. These include the following areas:

In Willapa Bay: (Wahl 1976, Welch 1976)

Leadbetter Point mudflats and sandy beach:

Shoalwater Bay mudflats to Toke Point:

North Cove Mudflats:

In Grays Harbor: (Whal 1976, Smith 1976).

Salt marsh east of Westport Air Strip:

Elk River estuary:

North Bay Flats - particulary near Pt. New (5000 to 6000 observed at one time)

Pt. Damon spit and mudflats:

In several other coastal areas they occur in small numbers (Wahl 1976).

DATA GAPS - Systematically census migrating populations and map feeding areas.

REFERENCES - 131, Wahl 1976, Wahl and Paulson 1973, Salo 1975, Welch 1976, Smith 1976.

FACT SHEET

B-61 PECTORAL SANDPIPER

Calidris melanotos

LIFE HISTORY - See WDG Report (Salo 1975).

WASHINGTON DISTRIBUTION - Uncommon but regular fall migrant (mid-August to early November) on both sides of the Cascades (somewhat more numerous west of the mountains) frequenting the edges of fresh or salt water flats where there is grass or sedges. Rare-uncommon spring migrant (April - May) and winter visitor in Western Washington (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The pectoral sandpiper feeds and rests primarily in salt marshes, salt marsh sloughs and associated mudflats of large estuaries. The pectoral sandpiper feeds on crustaceans, insects, and molluscs of the tideflats and salt marshes.

CRITICAL HABITAT AREAS - Due to wide distribution in salt marshes, salt water sloughs and associated mudflats and no areas with large concentrations,no critical areas have been mapped. Their habitats must be preserved in order to maintain state populations of pectoral sandpiper.

DATA GAPS - Systematic census of migrating populations.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976.

FACT SHEET

B-62 LEAST SANDPIPER

Calidris minutilla

LIFE HISTORY - See WDG Report (Salo 1975).

WASHINGTON DISTRIBUTION - Common spring (April to May), and late summer and and fall (late July to November) migrant on fresh and salt water beaches, mostly west of the Cascades. Regular but less numerous in Eastern Washington (131, Wahl and Paulson 1973). It is particularly abundant along Pacific Coast.

HABITAT REQUIREMENTS - The least sandpiper rests and feeds on tideflats, salt marsh, sandy spits, fine sediment beaches of small and large estuaries, sandy spits, and undeveloped sandy beaches of "inside waters". On beaches and mudflats, least sandpipers feed primarily on small amphipods (*Anisogammarus sp.* and *Corophium spp.*). It is also thought that this species does not have any clear food preference but uses food sources which are available and locally abundant. At high tide, elevated mud-flats are preferred as feeding sites. At low tide, the birds generally move to sandier mudflats probably to feed on worms (*Polychaeta sp.*) (Couch 1966 and Sanger 1970 in Salo 1975).

CRITICAL HABITAT AREAS - The species is abundant and widely distributed throughout the coastal and estuarine areas. One area is mapped as a critical area.

Willapa Bay and Leadbetter Point - (50,000 in September, 10,000 in December and 7,400 in April, 773).

Other concentration areas include Washington Islands National Wildlife Refuge 15,000 in April and 1,000 in October (773), Dungenesss Spit over 500 in September (910), San Juan Islands National Wildlife Refuge 1400 in May (773), Skagit Flats 200 in April (771), and Grays Harbor 450 in November (Smith and Mudd 1975).

DATA GAPS - Systematically census migrating populations and map feeding areas.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Couch 1966 and Sanger 1970 in Salo 1975, 773, 771, Smith and Mudd 1975.

FACT SHEET

B-63 DUNLIN

Calidris alpina

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (April to May) and fall migrant (peak in September to October) and locally abundant winter visitor west of the Cascades on fresh and salt water flats and beaches (131, 132). A few observed in summer. Rare spring and uncommon fall migrant in Eastern Washington. Migration more pronounced along coast and wintering flocks most common in Puget Sound region from Tacoma to Boundary Bay (132). Appear to be most abundant migrant and wintering sandpiper in the State (Salo 1975).

HABITAT REQUIREMENTS - Dunlin utilize sand, mud, and salt marsh habitats. Preferred feeding sites are sandy ocean beaches and tidal flats where they feed on amphipods, insects, worms and small molluscs (Wahl 1976, Bent 1972 and Couch 1966 in Salo 1975).

CRITICAL HABITAT AREAS - Because of its abundance and wide distribution it is difficult to identify specific critical areas. Some of the major concentration areas include:

Washington Islands National Wildlife Refuge - April counts as high as 27,000 and fall counts as high as 33,000 (773). (Not specific enough to be mapped).

San Juans National Wildlife Refuge - May counts as high as 25,000 (773). (Not specific enough to be mapped).

Willapa Bay National Wildlife Refuge - Fall counts as high as 16,000 and December count peaks of 50,000 (773).

Grays Harbor - Grays Harbor has had the highest Christmas count of dunlins in the United States in recent years (Smith 1976). The 1974 Christmas count was over 40,000. A mudflat near Moon Island is extremely valuable to wintering dunlins and is probably the most valuable area in Grays Harbor. Migratory and wintering population numbers in the mudflat area range from 40,000 to 50,000. Other concentration areas in Grays Harbor are shown on the maps (Smith 1976).

Padilla Bay - December counts of 11,470 (192).

Other Concentration Areas in Washington: Peak population numbers recorded for these areas are shown in brackets. Ocean Shores [2,900 in December (771)], Hoquiam and vicinity [5,500 in October (771)], Bellingham Bay [5,735 in December (188)], Skagit Flats [3,000 in January (771)], Port Susan [2,000-5,000 from November to March (903)], Boundary Bay [5,000 in November (771)], Blaine and Drayton Harbor [2,500 in January (772)].

DATA GAPS - Systematic counts of dunlin populations need to be initiated throughout coastal and estuarine areas of Washington. Specific habitat requirements for Washington populations should be investigated.

REFERENCES - Sources included 131, 132, Salo, Smith and Mudd 1975, Wahl 1976, Smith 1976, 771, 192, 188, 903, 772, 773.

FACT SHEET

B-64 SHORT-BILLED DOWITCHER

Limnodromus griseus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (March to early May) and fall (early August to December) migrant, mostly west of the Cascades. A few have been recorded in winter and summer (non-breeders) (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The short-billed dowitcher rests and feeds on tideflats, undeveloped sandy beaches of "inside waters" and along mud and sandy beaches of small and large estuaries (Wahl 1976). It is a shallow water feeding bird that immerses its head to probe for marine worms, leeches, small molluscs, fish eggs and occasionally small amounts of plant matter (Bent 1972 in Salo 1975).

CRITICAL HABITAT AREAS - No critical areas were mapped due to wide distribution and its lack of recorded concentration areas. Some of the areas where larger numbers have been recorded include: Willapa Bay (1,000 in September and 400 in April, 771, 773) Grays Harbor (50 near Westport in September, 771) 60 in Aug. and 1,000 unidentified dowitchers in April and May and 800 unidentified ones in July and Oct. (Smith and Mudd 1975), Hoquiam (50 in October, 771) Dungeness Bay and Spit (very common in April, May, September, and October.

(165), and San Juan Island and vicinity (common migrant (774). Protection of mudflats and sandy beaches will be needed to maintain state populations.

DATA GAPS - Systematic census of migrating populations.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976, 771, 773, 165, 774, Smith and Mudd 1975, Bent 1927 in Salo 1975.

FACT SHEET

B-65 LONG-BILLED DOWITCHER

Limnodromus scolopaceus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring and fall migrant and rare summer straggler (mostly east of the Cascades) on salt water and fresh water, habitats. Uncommon winter visitor west of the Cascades (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The long-billed dowitcher feeds and rests on mudflats, undeveloped sandy beaches of "inside waters", along fine sediment beaches of small and large estuaries and on beaches of Columbia River estuary islands (Wahl 1976). It is assumed to feed on small crustaceans, insects, molluscs, marine worms and some plant matter (Salo 1975).

CRITICAL HABITAT AREAS - Locations of important areas where large numbers have been reported include: Grays Harbor (1,000 in April plus 1,000 unidentified dowitchers sp. in April and May and 800 unidentified dowitchers in July and October (Smith and Mudd, 1975), Washington Islands National Wildlife Refgue (6,000 in February, 12,000 in April), Willapa Bay National Wildlife Refuge (30,000 in December and 13,800 in April, 773). Copalis Beach (800 in October, 904), San Juan Islands and vicinity

[hundreds during migration (774)], San Juan Island National Wildlife Refuge [350 in Jan. (773)], Skagit Flats [common in fall (131)]. Protection of mudflats and sandy beaches will be needed to maintain state populations. No critical areas are designated.

DATA GAPS - Systematic census of migrating and wintering populations. Seperate short-billed populations from long-billed species on census.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976, Salo 1975, 773, 774, 904, Smith and Mudd 1975.

FACT SHEET

B-66 WESTERN SANDPIPER

Calidris mauri

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (April and May) and fall (early July to December) migrant on flats along waters of Western Washington. Uncommon spring, late summer and early fall (early July to September) migrant in Eastern Washington. A few winter in southwestern Washington along the coastal bays and estuaries (131, Wahl and Paulson 1973, Wahl 1976). It is probably the second most abundant migrating shorebird in the state (Salo 1975).

HABITAT REQUIREMENTS - The western sandpiper feeds and rests on ocean sandy beaches, tidal flats, fine sediment beaches of large and small estuaries, salt marsh, sandy spits, undeveloped sandy beaches and shorelines of Columbia River Islands (Wahl 1976). It feeds on small crustaceans particularly amphipods (*Anisogammarus sp.* and *Corophium spp.*), worms (*Polychaeta sp.*), insects and probably small molluscs. It appears to be an opportunistic feeder with prey species often consumed in proportions corresponding to abundance (Couch 1966 in Salo 1975).

CRITICAL HABITAT AREAS - Because of its wide distribution and abundance it is difficult to map specific sites. Some of the general important areas where large numbers have been recorded include: Washington Islands National

Wildlife Refuge (10,000 in May, 6,000 in October, 600 in February, 773), Willapa Bay National Wildlife Refuge (11,400 in April, 3,000 in September, 50,000 in December, 773), Westport (3,000 in May, 771), Grays Harbor (10,000 in March, April, May, and August, 1,000 in September, October, November, and February (Smith and Mudd, 1975), Dungeness (1,000 in August, 771), Skagit Flats (5,000 in April, 771), Padilla, Samish and Fidalgo Bays (hundreds during fall and spring migration and many during winter, Wahl 1975). No critical areas are designated.

DATA GAPS - Systematic census of migrating and wintering populations.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Wahl 1976, Couch 1966 in Salo 1975, 773, 771, Smith and Mudd 1975, Wahl 1975.

FACT SHEET

B-67 SANDERLING

Calidris alba

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (April-May) and fall (September-October) migrant and winter resident along salt water shores and tideflats, being most numerous on the ocean beaches and less common on inland marine waters, rare on fresh water. Uncommon fall and spring migrant in Eastern Washington along lakes. Seems to be increasing in Puget Sound area particularly in winter (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The primary habitats of the sanderling are sandy ocean beaches and sandy spits. Other areas include tidal flats, fine sediment shorelines of small and large estuaries, and undeveloped sandy beaches of "inside waters" (Wahl 1976). Sanderlings are thought to show some definite food preferences. Amphipods (*Anisogammarus confervicolus* and *Orchestoidea pugettensis*) are frequently taken on tidal flats along Pacific Coast and in Puget Sound Region. Razor clams are also taken on the ocean coast. Other food sources include small molluscs, crustaceans, insects and marine worms (Couch 1966 in Salo 1975 and 132).

CRITICAL HABITAT AREAS - Due to wide distribution and abundance along sandy beaches particularly in winter, critical areas have not been mapped.

Important areas where large numbers have been recorded include Copalis Beach (500 in May and August, 200 in January, 1,300 in October, 904), Westport to Tokeland (200 in February, 771), Washington Islands National Wildlife Refuge (15,000 in October, 3,000 in September, 2,000 in February, 773), Willapa Bay National Wildlife Refuge (5,000 in December and February, 3,000 in September, 6,800 in May, 773), Ilwaco (200 in May, 771), Ilwaco to Leadbetter Point (300 in May, 771), Dungeness (300 in July, 771), San Juan Islands National Wildlife Refuge (7,000 in October, 6,000 in April, 773), Cultus Bay, Whidbey Island (100 to 450 from October to April, 853).

DATA GAPS - Systematically census migrating and wintering birds and map their distribution.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Wahl 1976, Couch in Salo 1975, 132, 904, 771, 773, 853.

FACT SHEET

B-68 BLACK OYSTERCATCHER

Haematopus bachmani

LIFE HISTORY - See WDG Reports, Salo 1975, Eaton 1975.

WASHINGTON DISTRIBUTION - Uncommon permanent resident and migrant along rocky shores and offshore islets along the ocean coast and in the San Juan Islands (131, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The oystercatchers nest on rock and mixed coarse beaches above the high water mark of coastal rocky shores and offshore islets. The nest is often a depression on bare rock lined with rock or shell chips. Eggs are laid in May and early June with the precocious young hatching in approximately 30 days. The oystercatchers feed on invertebrates in rocky and mixed coarse intertidal zones of rocky ocean beaches, ocean jetties and rocky undeveloped beaches of "inside waters" (Wahl 1976). There appears to be a correlation between the availability of suitable feeding habitat and the range of the oystercatcher. Principal food items include limpets, chitons, and mussels (132).

CRITICAL HABITAT AREAS - The total population of the state was estimated at 200 in 1909 (Dawson 1909 in Eaton 1975). A similar population estimate was derived for the current populations (Nysewander 1974) indicating fairly stable populations in Washington (Davidson 1975 in Salo 1975). In general there are one to three pairs on any given suitable islet. A few larger

islands, with enough breeding habitat, may support larger populations such as Destruction Island which had 20 pairs in 1974 (904). Breeding areas mapped as critical include the following areas in Washington Islands National Wildlife Refuge (Estimates are of peak production from 1970 - 1974 (904):

Grenville Arch - production of 2 (904)

Split Rock - production of 2 (904)

Destruction Island - production of 60 (904)

Abby Islet - production of 3 (904)

Alexander Rock - production of 20 (904)

Carroll Island - production of 11 (904)

Bald Island - production of 10 (904)

Ozette Island - production of 2

Bodelth Islands - production of 5 (904)

Another area on outer coast is:

Tatoosh Island - with 20 pair (Welch 1976)

San Juan Archipelago Islands with possible breeding populations include:

Low Island - (907)

Yellow Island - (907)

Bare Island - (907)

Smith Island - (907)

Colville Island - [1 nest (180)]

Pointer Island - [1 nest (180)]

Long Island - (907)

South Peapod Rocks - (912)

In addition islands in San Juan Islands National Wildlife Refuge have produced an estimated 10 birds in a single year (773).

DATA GAPS - Conduct periodic systematic censuses of breeding populations.

REFERENCES - 131, 132, Wahl and Paulson 1973, 904, Welch 1976, 907, 180, 912, Nysewander 1974, Davidson 1975 in Salo 1975, Eaton, 1975.

FACT SHEET

B-69 SEMI-PALMATED PLOVER

Charadrius semipalmatus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (May) and late summer and fall (middle of July to late September) migrant and rare non-breeding summer resident, mostly along the sea coast and Puget Sound, where it prefers salt water beaches and nearby fresh water flats and meadows. Most numerous in fall migration. Rare east of Cascades. Rare winter visitor, primarily in coastal areas of southwestern Washington (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The semi-palmated plover feeds and rests on sandy ocean beaches, fine sediment tidal flats, beaches of large and small estuaries, and sandy spits (Wahl 1976). The semi-palmated plover feeds on invertebrates of the beach and tidal mudflat fauna including small molluscs, amphipods and other crustaceans and insects (Bent 1929 in Salo 1975).

CRITICAL HABITAT AREAS - Due to wide distribution and abundance no specific critical areas have been mapped. Important areas where the larger concentrations have been observed include Willapa Bay National Wildlife Refuge 1,600 in September and 300 in April and December, 773), Dungeness National Wildlife

Refuge very common, 165), San Juan Island and vicinity (very common, 774), San Juan Islands National Wildlife Refuge (200 birds in April, 773).

No critical areas are mapped.

DATA GAPS - Systematically census migrating and wintering populations.

REFERENCES: Salo 1975, 131, Wahl and Paulson 1973, Wahl 1976, Wahl 1976, Bent 1929 in Salo 1975, 773, 165, 774.

FACT SHEET

B-70 KILLDEER

Charadrius vociferus

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common permanent resident and migrant, though less numerous in winter, especially in the interior. It is not as common near salt water as inland but it is extremely widespread in distribution. It breeds in the Puget Sound region, in the San Juan Archipelago and along the coast of the Strait of Juan de Fuca in addition to several other areas throughout the State (131, Wahl and Paulson 1973, Wahl 1976).

HABITAT REQUIREMENTS - The killdeer utilizes mudflats, sandy spits, fine sediment and shores of large and small estuaries and undeveloped sandy beaches of "inside waters" (Wahl 1976). Its nests are depressions in the ground, on sandy beaches and spits in salt water areas. The killdeer has a varied diet which in marine areas includes insects, small molluscs and crustaceans (132, Bent 1929 in Salo 1975).

CRITICAL HABITAT AREAS - No critical areas are mapped due to wide distribution and abundance throughout the state.

DATA GAPS - Populations could be surveyed in conjunction with other shorebirds but no special effort appears to be needed.

REFERENCES - 131, Salo 1975, Wahl and Paulson 1973, Wahl 1976, Bent 1929 in Salo 1975.

FACT SHEET

B-71 BLACK-BELLIED PLOVER

Pluvialis squatorola

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (April and May) and fall (late July to November) migrant and less common winter resident along the ocean coast and in Puget Sound less numerous east of the Cascades. Particularly common at Willapa Bay (Leadbetter Point, etc.) and Grays Harbor in migration. Also an uncommon non-breeding summer visitor in salt water areas (131, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The primary habitat is mudflats. Other habitats utilized are sandy ocean beaches, fine sediment shores of large and small estuaries, salt marsh, sandy spits and undeveloped sandy beaches of "inside waters". The diet of the black-bellied plover is variable. In marine habitats, primarily tidal flats, it consumes worms, small molluscs, crustaceans and marine insects (Bent 1929 in Salo 1975).

CRITICAL HABITAT AREAS - One major migration and winter concentration area mapped as a critical area is:

Willapa Bay-Leadbetter Point - 6,000 in December, 1,200 in February, 2,700 in April, 2,000 in September, 773).

Other important areas for plover include: Washington Islands National Wildlife Refuge (3,000 in December, 800 in February, 2,500 in May, and 2,500 in September, 773), Grays Harbor (1,000 in April, over 200 in August) (Smith and Mudd, 1975), Copalis Beach (120 in October, 904), Dungeness Spit (150 in March, 300 in September, 771), San Juan Island National Wildlife Refuge (12,000 in October, 1,800 in September, 773), Padilla and Samish Bays (hundreds, Wahl 1975 and Wahl 1976).

DATA GAPS - Systematically census migrating and wintering populations.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Bent 1929 in Salo 1975, 773, Smith and Mudd 1975, 771, Wahl 1975, and Wahl 1976.

FACT SHEET

B-72 SURFBIRD

Aphriza virgata

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Common spring (March-May) and fall (July-September). migrant and winter visitor on salt water. Most numerous on the outer coast. Fairly common July-August on the offshore rocks of San Juans (131, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The primary habitats of the surfbird are rocky and mixed coarse ocean beaches, sandy spits, rocky beaches of "inside waters" and particularly ocean jetties. The surfbird feeds on crustaceans such as small barnacles and small molluscs of the rocky intertidal zones (Bent 1929 in Salo 1975).

CRITICAL HABITAT AREAS - Important migration and wintering areas mapped include several areas in Washington Islands National Wildlife Refuge (200 in February and August and 410 in April for total refuge, 773), Copalis Rocks area (Wahl 1976), Quillayute Needles (Wahl 1976), Destruction Island (20 in June and July, 907), Flattery Rocks area (Wahl 1976). Other areas include: mouth of Grays Harbor and Westport jetties (63 in October, 771), Ocean Shores (95 in December, 771), San Juan Islands National Wildlife Refuge (25 in August, 773), (Wahl 1976), and Penn Cove (20 in April, 50 in August, and 30 in September, 771). No critical areas are mapped.

DATA GAPS - Census of migrating and wintering populations.

REFERENCES - 131, Wahl and Paulson 1973, Bent 1929 in Salo 1975, 773, 904, Wahl 1976, 907, 771.

FACT SHEET

B-73 RUDDY TURNSTONE

Arenaria interpres

LIFE HISTORY - See WDG Reports, Salo 1975.

WASHINGTON DISTRIBUTION - Uncommon spring and fall migrant and rare winter visitor along the ocean coast and in northern Puget Sound region. Rare migrant (May, August to early September in Eastern Washington) (131, Wahl and Paulson 1973).

HABITAT REQUIREMENTS - The ruddy turnstone utilizes a variety of habitats including mixed coarse and rocky ocean beaches, mixed fine tidal flats, salt marsh, sandy spits, ocean jetties, and rocky sandy beaches (Wahl 1976). It feeds on available worms, crustaceans and molluscs occurring on beaches and mudflats (131).

CRITICAL HABITAT AREAS - No critical areas have been mapped. Some of the areas where the larger concentrations have been recorded include: Westport (20 in May, 910), Grays Harbor (192 in May, Smith and Mudd, 1975), Washington Islands National Wildlife Refuge (70 in May and 10 in September, 773), Willapa National Wildlife Refuge (100 in December and 10 in May and August, 773), Dungeness (60 in July, 20 in May, 772), San Juan Islands National Wildlife Refuge (70 in October, 773), and March Point (25 in February, 910).

DATA GAPS - Systematic census of populations.

REFERENCES - 131, Wahl and Paulson 1973, Wahl 1976, 910, 773, 772.

FACT SHEET

B-74 BLACK TURNSTONE

Arenaria melanocephala

LIFE HISTORY - See WDG Report, Salo, 1975.

WASHINGTON DISTRIBUTION - Common spring (April-May) and fall (early July-October) migrant and winter visitor, mostly along the ocean coast and less commonly in the Puget Sound region. Prefers rocky beaches where occasionally found in large, though scattered flocks (131, Wahl and Paulson, 1973).

HABITAT REQUIREMENTS - Black turnstones utilize rocky and mixed coarse ocean beaches, tidal flats, sandy sptis, rocky beaches of "inside waters" and, in particular, ocean jetties (Wahl, 1976). Their diet consists of marine animals such as limpets, barnacles and small crustaceans (132).

CRITICAL HABITAT AREAS - Migration and winter areas mapped as important areas include rocky beaches and jetties at Westport (18 in October, 771, Wahl, 1976), Willapa National Wildlife Refuge (1,000 in December, 100 in February, 500 in September, 773), Washington Islands National Wildlife Refuge (Wahl, 1976), San Juan Islands National Wildlife Refuge (1,200 in November, 500 in August, and 475 in April, 773), Penn Cove (225 in April, 160 in August, 771), and Deer Lagoon, Whidbey Island (150 in September, 771). No critical areas were designated.

DATA GAPS - Systematically census migrating and wintering populations.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Wahl 1976, 773, 771, 190, 132.

FACT SHEET

B-75 BELTED KINGFISHER

Megaceryle alcyon

LIFE HISTORY - See WDG Report, Salo 1975.

WASHINGTON DISTRIBUTION - Regular migrant and permanent resident throughout the State on fresh and salt water. Every body of water and stream of any size in Washington usually has one or two kingfishers (131, Wahl and Paulson 1973). It is commonly seen near marine habitats and although not abundant in any particular location it is quite evenly distributed in suitable habitats.

HABITAT REQUIREMENTS - The belted kingfisher nests in tunnels burrowed in steep sandy riverbanks or bluffs overlooking the beach, commonly in quite inaccessible locations. Its diet is primarily fish which are caught by diving from the air. Kingfishers also eat crabs and other life forms of marine habitats (131). It utilizes open waters of channels and reefs of "inside waters", rocky islands, tidal flats, small and large estuaries, undeveloped sandy and rocky beaches, Columbia River estuary islands and protected waters such as harbors of Puget Sound (Wahl 1976).

CRITICAL HABITAT AREAS - No critical areas were mapped due to abundance and wide spread distribution throughout the state.

DATA GAPS - Low priority species as far as future studies. Census studies could be taken in conjunction with other species.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Wahl 1976.

FACT SHEET

B-76 NORTHERN BALD EAGLE

Haliaeetus leucocephalus alascansas

LIFE HISTORY - See WDG Reports, Salo 1975, Eaton 1975.

WASHINGTON DISTRIBUTION - Fairly common permanent resident along salt water and inland lakes and rivers west of the Cascades. Occasionally seen by sub-alpine lakes in mountains and along the large lakes and rivers in Eastern Washington, especially in winter. It breeds primarily west of the Cascades although some breeding may occur in isolated areas in Eastern Washington. It is a particularly common winter resident on the Olympic Penninsula, the San Juans, northern Puget Sound, the Skagit River, and Cowlitz River and near Hood Canal (131, Wahl and Paulson 1973, Eaton 1975). Between 250 and 300 bald eagle nests have been found in western Washington and about half (50 percent) of these are actively used each year (Grubb 1976). A midwinter inventory of bald eagles in 1974 recorded 321 eagles for Washington which was 10-15 percent of all bald eagles in continental United States (Eaton 1975).

HABITAT REQUIREMENTS - Bald eagle nests are large masses of sticks usually placed close to the trunk and near the top of large live trees particularly Douglas fir, sitka spruce and cottonwood. The majority of the nests are along the marine coastline and within 200 yards of shore. The nesting usually begins in February and the eaglets fledge in July (Grubb 1976).

The bald eagle's food habits are variable and greatly reflect the availability of food. Some of its foods include: dead and dying salmon, smelt, waterfowl, oystercatchers, puffins, gulls, guillemots, molluscs, small rodents and rabbits (Eaton 1975). It is a scavenger along many marine habitats including sandy and rocky ocean beaches, tidal flats, shorelines of small and large estuaries, and sandy and rocky beaches of "inside waters" (Wahl 1976).

CRITICAL HABITAT AREAS - The approximate location of nesting sites near marine shorelines are mapped as critical areas (Grubb 1976, Barth 1976). These areas are numerous and can be located on the associated maps.

General important areas where fairly large numbers (5-20) are often observed particularly during the winter include Willapa Bay, Grays Harbor, rocky ocean shoreline of northern Olympic Penninsula Coast, e.g., Pt. Grenville area, and Washington Islands National Wildlife Refuge (5 in March, 773), Skagit Flats (10 in December, 910), Deception Pass (20 in March, 909), Padilla Bay (16 in December, 192), Samish Bay, Nooksack River Delta in Lummi and Bellingham Bays (9 in December-January, 188), and San Juan Islands (9 in Wildlife Refuge in February, 773), 30 near San Juan Island from January to August, 181).

DATA GAPS - Contine to expand systematic census of nesting sites. Conduct ecological studies on distribution and importance of marine feeding sites.

REFERENCES - Salo 1975, 131, Wahl and Paulson 1973, Eaton 1975, Grubb 1976, Wahl 1976, 910, 773, 909, 192, 188, 181, Barth 1976.

FACT SHEET

B-77 OSPREY

Pandion haliaetus

LIFE HISTORY - See WDG Reports, Salo 1975, Eaton 1975.

WASHINGTON DISTRIBUTION - Uncommon migrant and summer resident along large rivers and lakes throughout the state; occasionally seen along salt water. A few winter west of the Cascades.

HABITAT REQUIREMENTS - The osprey nest is made of sticks and weed stalks and lined with softer materials. It is placed almost anywhere including on the ground, on old buildings, on cliffs or in trees. The osprey feeds almost exclusively by diving and capturing live fish (Eaton 1975).

The major marine habitats used by osprey as feeding areas include open waters over tideflats, small and large estuaries and near undeveloped sandy beaches of "inside waters" (Wahl 1976).

CRITICAL HABITAT AREAS - Areas where nesting has been recorded is mapped as critical include:

Discovery Bay

Rock Bay

Westcott Bay

San Juan Islands

Other areas near marine shoreline also probably have nesting birds. Some of these probably include the west side of Hood Canal, Port Gamble area, Neah Bay, and other areas in the San Juans, along the Strait of Juan de Fuca and along Columbia River estuary (Eaton 1975).

DATA GAPS - Systematically census breeding populations and map nesting sites.

REFERENCES - Salo 1975, Eaton 1975, Wahl 1976.

FACT SHEET

B-78 NORTHWESTERN CROW

Corvus caurinus

LIFE HISTORY - Important information is presented below.

WASHINGTON DISTRIBUTION - Common resident along the shores of the ocean coast and less abundantly along the San Juan Islands and Strait of Juan de Fuca. Winter resident along the lower Columbia River (131).

HABITAT REQUIREMENTS - The Northwestern crow scavenges along salt water beaches for mollusks, crustaceans, fish, sea bird eggs, insects and is usually found not more than 100 yards from salt water. Nests and night-time roosts may be located a few miles inland but the foraging is done close to salt water (131). It forages in a variety of marine habitats including sandy and rocky ocean beaches, rocky islands, tidal flats, shorelines of small and large estuaries, sandy spits, sandy and rocky undeveloped beaches of inside waters and shorelines of Columbia River Islands (Wahl 1976).

CRITICAL HABITATS - No areas are mapped because of wide distribution and use of many different habitats.

DATA GAPS - Systematically census populations.

REFERENCES - 131, Wahl 1976.

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