BLACKWATER ISLAND RESEARCH NATURAL AREA

Supplement No. 11[1]

Curt Wiberg and Sarah Greene[2]

The Research Natural Area described in this supplement is administered by the Fish and Wildlife Service of the U.S. Department of the Interior as part of the Ridgefield National Wildlife Refuge. Fish and Wildlife Service Research Natural Areas are administered through Area Offices; scientists wishing to use the Blackwater Island Research Natural Area should contact both the Area Manager (U.S. Fish and Wildlife Service, 500 N.E. Multnomah St., Portland, Oregon 97232) and the Refuge Manager (Ridgefield National Wildlife Refuge, 210 N. Main Street, Ridgefield, Washington 98642); the Refuge Manager supervises management activities at the Refuge and coordinates scientific work in the Research Natural Area. For brief observational visits, permission may be obtained from the Refuge Manager.

Blackwater Island Research Natural Area is a part of a Federal system of such tracts established for research and educational purposes. Each Research Natural Area constitutes a site where natural features are preserved for scientific purposes and natural processes are allowed to dominate. The main purposes are to provide:

1. Baseline areas against which effects of human activities can be measured;
2. Sites for study of natural processes in undisturbed ecosystems; and
3. Gene pool preserves for all types of organisms, especially rare and endangered species.

The total Federal system is outlined in "A Directory of the Research Natural Areas on Federal Land of the United States of America."[3] In Oregon and Washington, of the 64 Federal Research Natural Areas that have been established, 45 are described in "Federal Research Natural Areas in Oregon and Washington: A Guidebook for Scientists and Educators,"[4] along with details on management and use of such tracts; 10 have been described in supplements to the guidebook; this is the eleventh supplement.

The guiding principle in management of Research Natural Areas is to prevent unnatural encroachments, activities which directly or indirectly modify ecological processes on the tracts. Neither logging nor uncontrolled grazing is allowed, for example, nor is public use which threatens significant impairment of scientific or educational values. Management practices necessary for maintenance of the ecosystem may be allowed.

Federal Research Natural Areas provide a uniquely valuable system of publicly owned and protected examples of undisturbed ecosystems which are available to the scientific community. Research can be conducted with minimal interference and reasonable assurance that investments in long-term studies will not be lost to logging, land development, or similar activities. A scientist wishing to use a Research Natural Area assumes the responsibility to:

2. Obtain permission from the appropriate administering agency before using the area;[5]

[1]Supplement No. 11 to "Federal Research Natural Areas in Oregon and Washington: A Guidebook for Scientists and Educators," by Jerry F. Franklin, Frederick C. Hall, C. T. Dyrness, and Chris Maser (USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, 498 p., illus., 1972). The guidebook is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, for $4.90; stock number 001-001-00225-9.

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[3]Federal Committee on Ecological Reserves. 1977. A directory of Research Natural Areas on Federal lands of the United States of America. 280 p. USDA For. Serv., Washington, D.C.

[4]See footnote 1.

[5]There are five agencies cooperating in this program in the Pacific Northwest (each agency differs slightly in its requirements): Forest Service in the U.S. Department of Agriculture; Bureau of Land Management, Fish and Wildlife Service, and National Park Service in the U.S. Department of the Interior; and the U.S. Department of Energy.

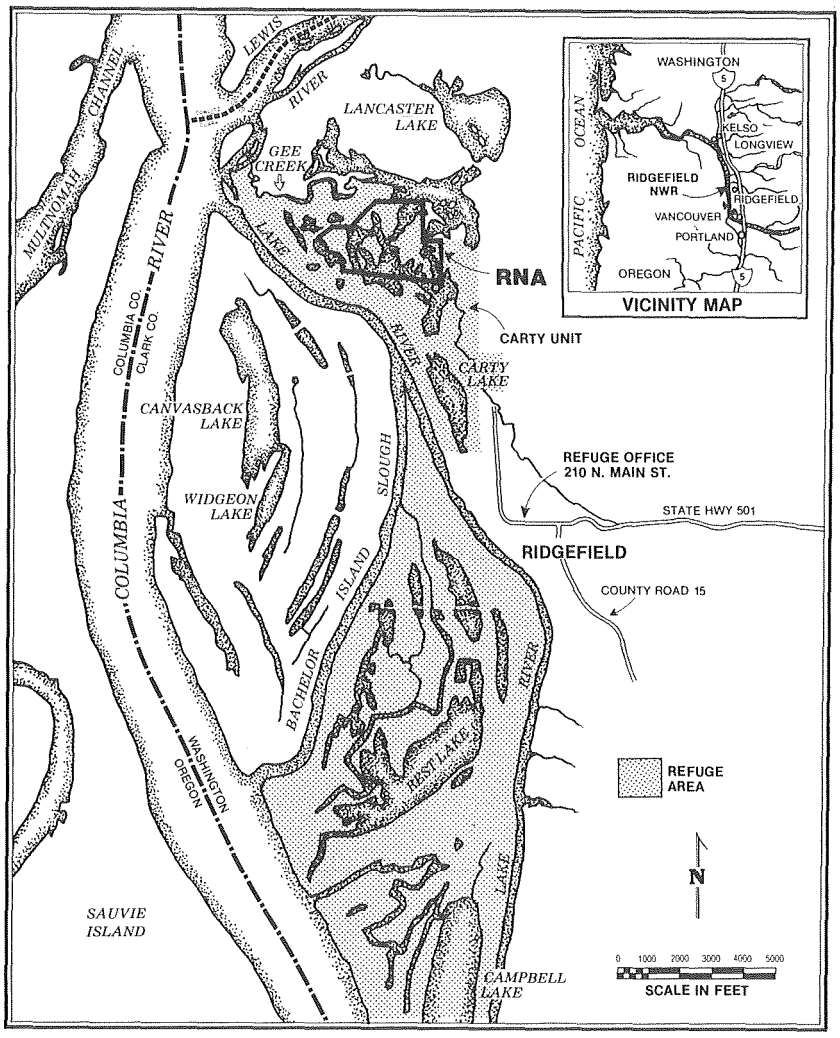
2. Abide by the administering agency's regulations governing use of the natural area, including specific limitations on the type of research, sampling methods, etc.; and
3. Inform the administering agency on the progress of the research, published results, and disposition of collected materials.

The purposes of these limitations are simple-to insure that the scientific and educational values on the tract are not impaired, to accumulate a documented body of knowledge about the tract, and to avoid conflict between studies. Research on Research Natural Areas must be essentially nondestructive; destructive analysis of vegetation is generally not allowed, nor are studies requiring extensive modification of the forest floor or extensive excavation of soil. Collection of plant and animal specimens should be restricted to the minimum necessary for provision of voucher specimens and other research needs; under no circumstances should collecting significantly reduce the population level of a species. Collecting must be carried out in accordance with State and Federal agency regulations.

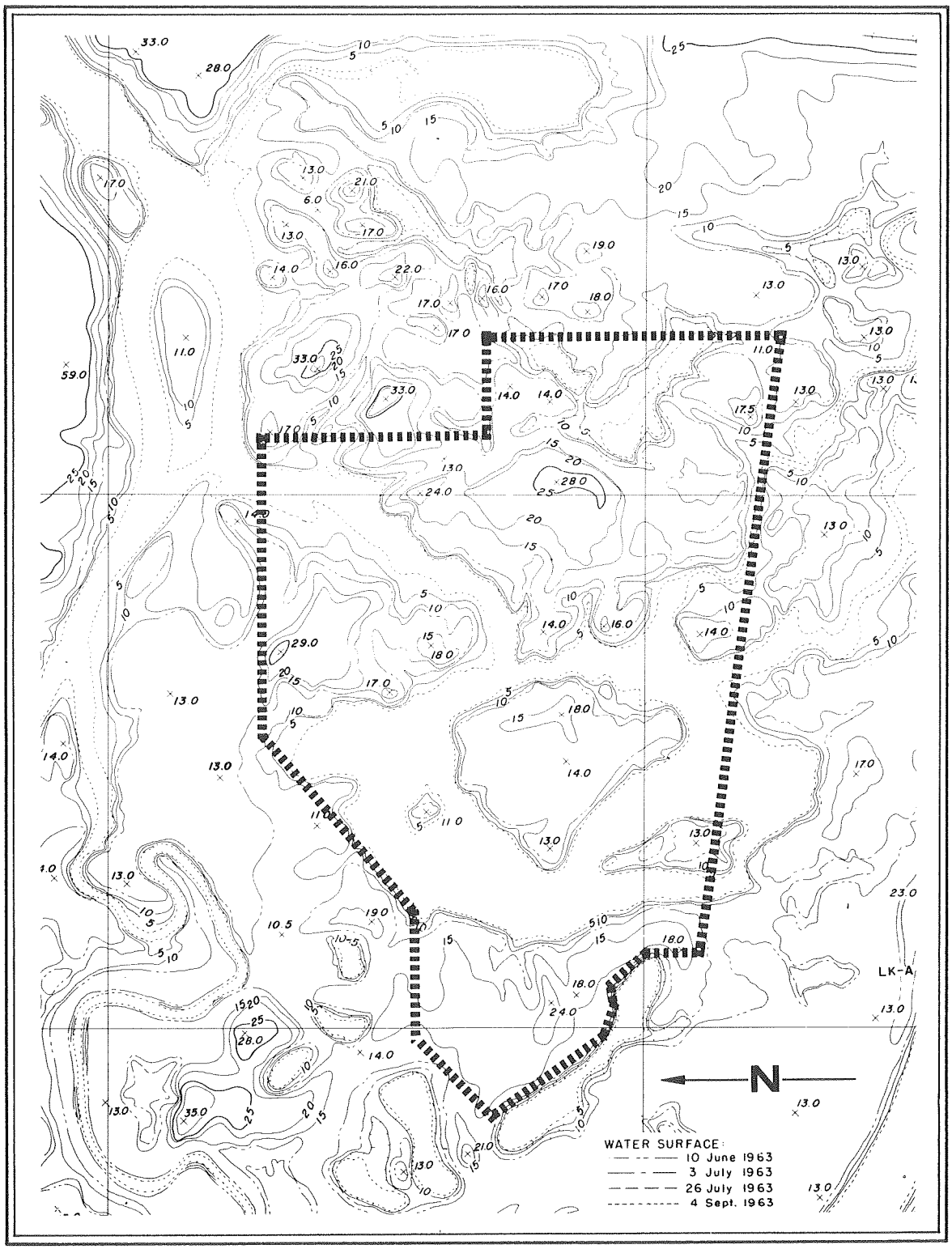
Flood plain communities of the Columbia River: shallow lakes surrounded by seasonally flooded willow lowlands bordering Oregon white oak stands on basalt islands.

The Blackwater Island Research Natural Area (RN A) was established in December 1972. It exemplifies the flood plain communities of the lower Columbia River, with Oregon white oak[6] occupying the basalt knolls and ridges above the flood zone. Pacific willows fringe the permanent lakes and channels, and a narrow belt of Oregon ash is found in the inter-flood zone between the Pacific willow and the oak. An herbaceous aquatic community is found along the shallow shorelines and in ephemeral ponds on the islands. The 52-hectare (129-acre) tract is located along the lower Columbia River in Clark County, Washington. It is administered by the Fish and Wildlife Service of the U.S. Department of the Interior and is part of the Carty Unit of the Ridgefield National Wildlife Refuge (Ridgefield, Washington). The RNA is in sec. 11, T. 4 N., R. 1 W. Willamette meridian (lat. 45°50' N.; long. 122°45' W.) (fig. BWI-1,2).

[6]Scientific names for plants, birds, and animals appear in tables BWI-1, 2, and 3.



BWI-1. Location of Blackwater Island RNA within Ridgefield National Wildlife Refuge, Washington.



BWI-2. Topographic map of Blackwater Island RNA showing 5-foot contours.

Access and Accommodations

Blackwater Island RNA is located about 5 km (3 mil northwest of Ridgefield, Washington, and is accessible from U.S. Interstate 5 via State Highway 501. Directions for locating the tract are available from the Refuge Office, 210 N. Main Street, Ridgefield, W A 98642. The nearest commercial accommodations are approximately 23 km (14-1/4 mil south on Interstate 5 at Vancouver, Washington. Public camping is available at Paradise Point State Park, 13 km (8.1 mil north on Interstate 5.

Environment

Blackwater Island Research Natural Area varies in elevation from 0 to 18 m (60 ft). The topography is dominated by basalt knolls surrounded by lowlands. The lowlands are occupied by shallow lakes which fluctuate seasonally with water depth in the Columbia River. During the annual spring flood, water backs up in the lakes through Gee Creek and does not recede until the water level in the Columbia drops. Historically, spring floods lasted about 1 month during late May and June. Dams on the Columbia River have altered this pattern, and floods now last from 2 to 2-1/2 months with peaks reduced to 5 m (16.5 ft).

The refuge is underlain by Columbia River Basalt that is Miocene to Pliocene in age (Huntting et al. 1961). Exposures of the bedrock resistant to erosion, surrounded by recent alluvial deposits, form the islands included in the RN A. These exposures provide moderate relief of 0-12 m (40 ft).

The differences in parent material are reflected in the two soils found in the area (McGee 1972). The Olympic Very Stony Clay Loam, derived from the basalt, has up to 12percent basalt fragments by volume and an average depth of 76 cm (30 in). Because of its stoniness and shallow depth, this soil has a poor moisture supplying capacity. The Sauvie Silty Clay Loam, developed from the alluvial deposits of silt and clay, has medium texture and high clay content, which result in low permeability and high moisture capacity.

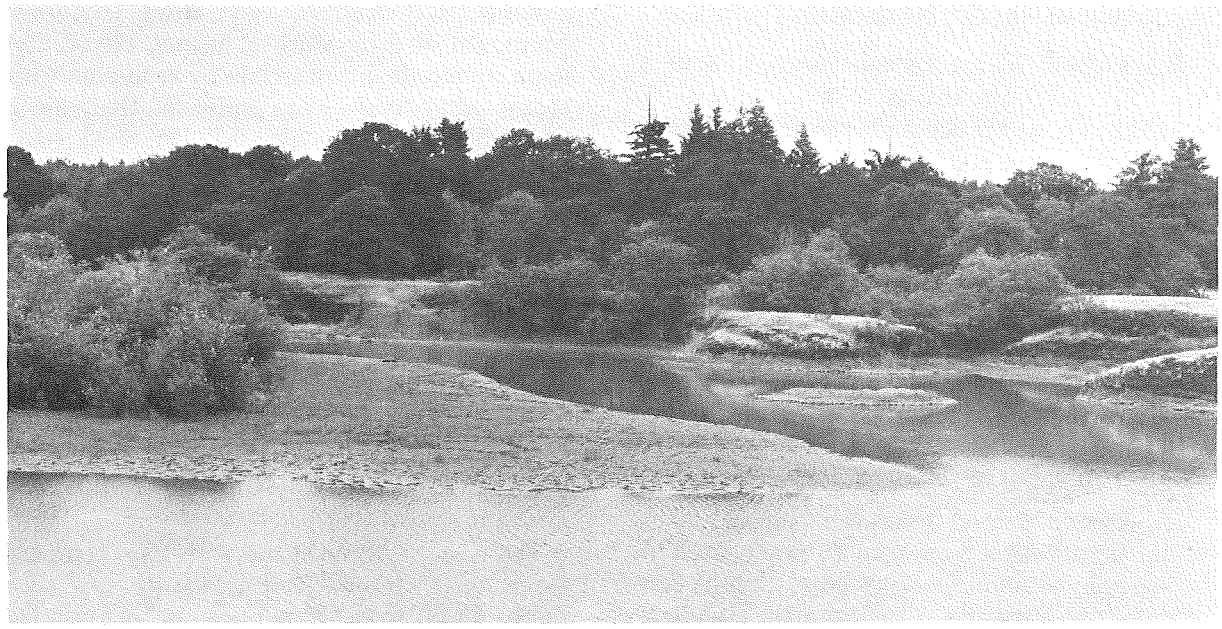
Olympic Very Stony Clay Loam (shallow variant) is a moderately shallow to very shallow, well drained, very stony soil. It is composed of dark reddish brown, stony, clay loam surface layer underlain by reddish brown, stony, silty clay loam subsoil. Bedrock is Columbia River Basalt, 0-11 m (0-36 ft), a moderate to acid soil with poor moisture supplying capacity.

Sauvie Silty Clay Loam is moderately well drained, medium textured bottomland soil. It is composed of a very dark grayish brown silt loam surface layer, underlain by a dark grayish brown silty clay loam subsoil extending to 90 cm (36 in). This soil developed on stratified layers of silt loam, loam, or fine sandy loam. It is slightly acid to neutral. Permeability is low, and moisture supplying capacity and fertility are high.

The climate is maritime with mild temperatures, wet winters, and relatively dry summers. Less than 7 percent of the annual precipitation falls during June, July, and August. Snow is rare. Data from the weather station, located approximately 30 km (18.75 mil south of the RNA in Portland, Oregon (U.S. Weather Bureau 1965), summarize temperature and precipitation:

Mean annual temperature	12.6°C	(54.6°F)
Mean January temperature	4.6°C	(40.2°F)
Mean July temperature	25.8°C	(78.4°F)
Mean January minimum temperature	1.4°C	(34.5°F)
Mean July minimum temperature	20.3°C	(68.5°F)
Average annual precipitation	1 076 mm	(43.04 in)
June through August precipitation	70 mm	(2.8 in)

This climatic regime, combined with flooding of the Columbia River, results in distinctly different conditions in the two soils. Because of its low permeability, the Sauvie Silty Clay Loam may be covered by standing water from rain in winter and floods in spring. But because of good drainage and higher elevation, the Olympic Very Stony Clay Loam is rarely



BWI-3. General habitat showing lakes and mud flats surrounded by a mosaic of riparian broad-leaved forest and grassland.

waterlogged unless it is covered by floodwaters. Since the Olympic Very Stony Clay Loam is perched on basalt bedrock, the soil moisture cannot be renewed from the water table. Once the moisture from precipitation is depleted, this soil maintains xeric conditions, even when the surrounding land is under water. The Sauvie Silty Clay Loam, on the other hand, remains moist even during severe drought.

Three topoedaphic zones result from the above combination of environmental factors. The flood plain is waterlogged in winter, submerged during spring, and moist throughout summer. The knolls above high water are moist but well drained in winter and early spring, and become droughty in summer. The moisture capacity of slopes between flood plain and knolls varies with degree of slope and the height and duration of spring floods.

Biota

The RN A consists of a zoned mosaic of forest and grasslands associated with a series of flood plain lakes (fig. BWI-3). The lakes are affected by changing water levels of the Columbia River, which also affect the surrounding riparian communities. These riparian communities of the Columbia River fall within the Interior Valley Zone classification of Franklin and Dyrness (1969).

Grasslands occupy about 4 ha (10 acres) scattered among the approximately 20 ha (50 acres) of oak-ash-willow woodlands. Dominance of tree species shifts with elevational gradient. Pacific willow occupies the flood plain, Oregon ash occurs on slopes from 3 to 6 m (10 to 20 ft) in elevation, and Oregon white oak is found on the basalt knolls above 6 m (20 ft). The remainder of the natural area is occupied by lakes and various aquatic communities.

The wettest vegetation community occupies exposed shallow mudflats along shorelines and ephemeral ponds on the islands. Herbaceous communities at the lowest elevation are dominated by *Polygonum punctatum.* From low to high water, a zonational sequence of *Eleocharis palustris- Veronica americana-Lysimachia nummularia-Carex* spp. is superimposed on the *Polygonum* community. A shrubby fringe of *Spiraea douglassii* and *Symphoricarpos albus* connects the pond community with the upland stands of Oregon ash. Pacific willow, when associated with this community, is found in the *Veronica-Lysimachia* zone.

BWI-4. A closed stand of Salix *along mud flat border.*

Pacific willow (Society of American Foresters 1954, SAF 222- Willow) grows along the shorelines of the islands, especially in shallow inlets, and along edges of ponds on the islands that are subject to annual flooding. Closed stands flourish on slightly exposed sections of Sauvie Silty Clay Loam in the flood plain (fig. BWI-4). Willow reproduction is greatest along the low water line where seedlings sprout in a cover of *P. punctatum* and
E. palustris.

Oregon ash (Kuchler 1964, Type 25-AlderAsh Forest) is found above Pacific willow along shorelines of major islands and around the ponds on the islands. Trees may be as large as 60-cm (24-in) d.b.h. but the average d.b.h. of most older trees is 40 cm (16 in). This community, like the willow community, is flooded every year. It has an elevation range of 6 m (20 ft). Most stands are relatively immature, and maximum density is found on areas of convex topography. The dense growth results in a sparse understory of *P. punctatum, Carex* spp., *Lolium multiflorum,* and *Poa compressa* (see figs. BWI-5, 6, and 7). More open grasslands in this zone include *Bromus* spp., *Holcus lanatus, Hordeum brachyantherum, andPoapalustris.*

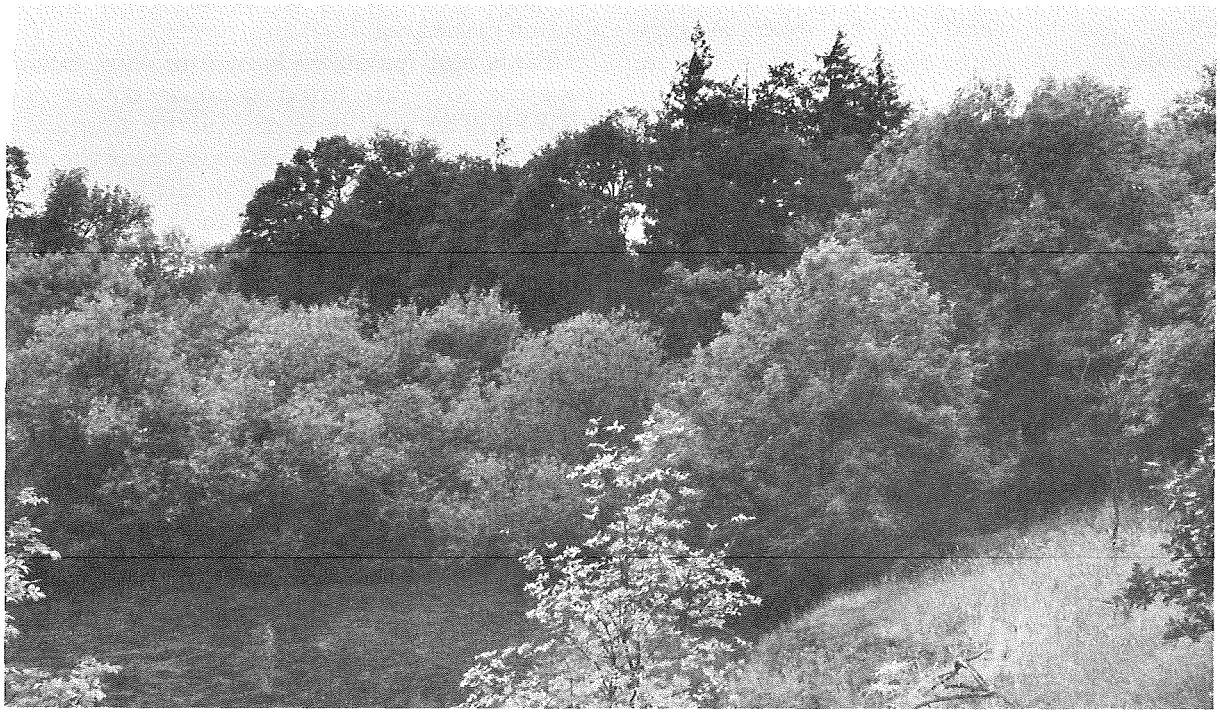
Oregon white oak (Society of American Foresters 1954, SAF 233-0regon White Oak; Kuchler 1964, Type-26, Oregon Oakwoods) is restricted to a zone on the basalt knolls above 6 m (20 ft) (fig. BWI-8). A few trees have diameters of 76-cm (30-in) d.b.h. or greater, but most of the larger trees are in the 40- to 60-cm (16- to 24-in) d.b.h. class. The oaks occur in closed stands interspersed with open grasslands. The understory is frequently dominated by *Agropyron caninum, Bromus sterilis,* and *Dactylis glomerata.* Open areas are dominated by *B. sterilis,* which is frequently the only grass found on shallow soils. Associates on deeper soils are *H. lanatus, D. glomerata, Elymus* sp. and *Bromus* spp. Other stands have a well-developed shrub understory of *Amelanchior alnifolia, Symphoricarpos albus,* and *Holodiscus discolor* with *Rhus diversiloba* scattered throughout the zone.

Few Douglas-fir are found in the RN A although the species is dominant or co-dominant in other parts of the Wildlife Refuge. In the RNA, it occurs at elevations of 10 m (33 ft) or above.

Zonation patterns in the RNA are attributed to several environmental conditions, one being

BWI-5. Basalt knoll with Fraxinus *and* Quercus *adjacent to an ephemeral pond containing* Polygonum, Eleocharis, *and* Carex.

BWI-6. Stand of Fraxinus *with a shrubby fringe of* Spiraea *and* Symphoricarpos.



BWI-7. Salix *stand on the flats surrounded by* Fraxinus *on lower slope of basalt knoll.*

BWI-8. Quercus *stand on top of basalt knoll.*

the favorability of germination sites (Morrison 1973).[7] Oregon white oak, for example, germinates well in sunny, dry areas but poorly on areas exposed to flooding and usually wet in spring. On the other hand, soil moisture and decreased insolation appear to be important for germination of Oregon ash, although excessive soil moisture appears to inhibit germination. Germination of Pacific willow is limited to open areas with moist or slightly submerged soil within a few meters of the water's edge.

[7]Morrison, Elizabeth. 1973. The Blackwater Island Research Natural Area. A description of the vegetation and environment. 45 p., illus. plus maps. On file at Ridgefield National Wildlife Refuge Office, Ridgefield, Wash.

Table BWI-1 is a tentative list of plants found in the area.

Birds and mammals known or expected to use the RNA are listed in tables BWI-2 and BWI-3. The area is important for migrating waterfowl. Little is known concerning the reptiles. Three have been seen in the Refuge and would most likely be found in the RNA: treefrog (*Hyla regilla*), common garter snake (*Thamnophis sirtalis*), and painted turtle (*Chrysemys picta*).[8]

[8]Verbal communication with staff member, Ridgefield National Wildlife Refuge, November 1980.

Table BWI-1—Tentative list of plants for Blackwater Island Research Natural Area[1]

Scientific name[2]	Common name
Acer circinatum Pursh	Vine maple
Acer macrophyllum Pursh	Big-leaf maple
Achillea millefolium L.	Western yarrow
Achlys triphylla (Smith) DC.	Deerfoot vanilla leaf
Agropyron caninum	Cutting wheatgrass
Alisma plantago-aquatica L.	American water plantain
Alnus rubra Bong.	Red alder
Amelanchier alnifolia Nutt.	Suskatoon serviceberry
Anaphalis margaritacea (L.) B. & H.	Pearly everlasting
**Anthemis cotula* L.	Stinking mayweed
Aquiligia formosa Fisch.	Red columbine
Arctium minus (Hill) Bernk.	Common burdock
Arenaria macrophylla Hook.	Big leaf sandwort
Arnica amplexicaulis Nutt.[2]	Clasping arnica
Aster sp.	Aster
Athyrium filix-femina (L.) Roth.	Lady fern
Barbarea orthoceras Ledeb.[2]	American wintercress
**Bellis perennis* L.	English daisy
Berberis aquifolium Pursh	Tall Oregon grape
Berberis nervosa Pursh	Oregon grape
Bidens vulgata Greene	Tall bur marigold
Brodiaea hyacinthina (Lindl.) Baker	Hyacinth brodiaea
Bromus sp.	Bromegrass
Bromus sterilus L.	Barren bromegrass
Camassia quamash (Pursh) Greene	Camas
Campanula scouleri Hook.	Scouler bellflower
**Capsella bursa-pastoris* (L.) Medic	Shepherd's purse
Cardamine pulcherrima Greene	Slender toothwort
Carex sp.	Sedge
Cerastium dubium L.	Doubtful chickweed
Cerastium viscosum L.	Sticky chickweed
Chrysanthemum leucanthemum L.	Oxeye daisy

Table BWI-1—Tentative list of plants for Blackwater Island Research Natural Area[1]—Continued

Scientific name[2]	Common name
Cirsium arvense (L.) Scop.	Canada thistle
Collinsia sparsiflora Fisch. & Mey.	Few flowered collinsia
Collinsia parviflora Lindl.	Small-flowered blue-eyed-mary
Collinsia grandiflora Lindl.	Large-flowered blue-eyed-mary
Coreopsis atkinsoniana Dougl.	Columbia coreopsis
Cornus nuttallii Aud.	Pacific dogwood
Cornus stolonifera Michx.	Red-osier dogwood
Corylus cornuta Marsh.	Western hazel
Crataegus douglassii Lindl.	Black hawthorn
Crocifium multicaule Hook.	Spring-gold
Dactylis glomerata L.	Orchard grass
**Daucus carota* L.	Wild-carrot
Delphinium nuttallii Gray[2]	Nuttall's larkspur
Dryopteris arguta (Kaulf.) Watt.	Coastal shield-fern
Eleocharis sp.	Spike sedge
Elymus sp.	Wild-rye
**Epilobium angustifolium* L.	Fire weed
Epilobium minutum Lindl.	Small-flowered willow-weed
**Erodium cicutarium* (L.) O'Her.	Filaree
Erythronium oregonum Applegate	Giant fawn-lily
Fragaria vesca L.	Western wood strawberry
Fraxinus latifolia Benth.	Oregon ash
Fritillaria lanceolata Persh	Mission bells
Galium trifidum L.	Small cleavers
Galium triflorum Michx.	Sweetscented bedstraw
Gaultheria shallon Pursh	Salal
**Geranium molle* L.	Dovefoot geranium
**Geranium pusillum* Burm.	Small-flowered crane's bill
Geum macrophyllum Willd. var. *macrophyllum*	Large leaf aveus
**Glecoma hederacea* L.	Creeping Charlie
**Gnaphalium uliginosum* L.	Marsh cudweed
**Helenium autumnale* L. V. *grandiflora* Nutt.	Sneezeweed
Holcus lanatus L.	Velvet grass
Holodiscus discolor (Pursh) Maxim.	Creambush oceanspray
Hordeum brachyantherum Nevski	Meadow barley
**Hypochaeris radicata* L.	Spotted catsiar
Impatiens capensis Meerb.	Orange balsam
Juncus sp.	Rush
**Lathyrus latifolius* L.	Ever-lasting pea
Lemna minor L.	Water lentil
Lithophragma parviflora (Hook.) Nutt.	Small-flowered fringe-cup
Lilium columbianum Hanson	Tiger lily
Lolium multiflorum Lam.	Italian ryegrass
Lonicera ciliosa (Pursh) DC.	Orange honeysuckle
Lysichitum americanum Hulten & St. John	Skunk cabbage
**Lysimachia nummularia* L.	Money wort

Table BWI-1—Tentative list of plants for Blackwater Island Research Natural Area[1]—Continued

Scientific name[2]	Common name
Mentha arvensis L.	Corn mint
Mimulus gutatus DC.	Monkey flower
Montia perfoliata (Donn) Howell	Miner's lettuce
Myosotis discolor Pers.	Yellow and blue forget-me-not
Myosotis laxa Lehm.	Small-flowered forget-me-not
Navarretia squarrosa (Esch.) H. & G.	Skunkweed
Nepeta cataria L.	Catnip
Nuphar polysepalum Engelm.	Spatterdock
Oemleria cerasiformis (T. & G.) Green	Indian plum
Oenanthe surmentosa Presl	Water parsley
Orobanche uniflora L.	Naked broom rape
Osmorhiza chilensis H. & A.	Mountain sweet root
Parentucellia viscosa (L.) Can.	Parentucellia
Phacelia sp.	Phacelia
Philadelphus lewisii Pursh	Western syringa
Physostegia parviflora Nutt.	Physostigia
**Plantago lanceolata* L.	English plantain
Plantago major L. *v. major*	Common plantain
Plectritis congesta (Lindle.) DC.	Rosy plectritis
Poa compressa L.	Canada bluegrass
Poa palustris L.	Fowl bluegrass
Polygonum punctatum Ell.	Dotted smartweed
Polypodium glycerrhiza DC. Eat.	Licorice fern
Polystichum munitum (Kaulf.) Presl	Swordfern
Populus trichocarpa T. & G.	Black cottonwood
Potentilla glandulosa Lindle.[2]	Gland cinquefoil
**Prunella vulgaris* L.	Heal-all
Pseudotsuga menziesii (Mirb.) Franco	Douglas-fir
Pyrus fusca Raf.	Western crabapple
Quercus garryana Dougl.	Oregon white oak
Ranunculus orthorhynchus Hook.	Straightbeak buttercup
**Ranunculus repens* L.	Creeping buttercup
Ranunculus sardos Crantz	Hairy buttercup
Ranunculus uncinatus D. Don.	Little buttercup
Rhamnus purshiana DC.	Cascara
Rhus diversiloba T. & G.	Poison-oak
Ribes sanguineum Pursh	Red-flowered currant
Ribes sp.	Currant
Rorippa islandica (Oed.) Borbas	Marsh yellowcress
**Rosa eglanteria* L.	Sweetbriar rose
Rosa gymnocarpa Nutt.	Baldhip rose
Rosa nutkana Presl	Nootka rose
**Rosa pisocarpa* Gray	Clustered wild rose
Rubus discolor Weihe & Ness.	Himalayan blackberry
Rubus laciniatus Willd.	Evergreen blackberry
Rubus leucodermis Dougl.	Blackcap
Rubus macrophyllus Weihe & Ness.	Large-leaved blackberry
Rubus parviflorus Nutt.	Thimbleberry

Table BWI-1—Tentative list of plants for Blackwater Island Research Natural Area[1]—Continued

Scientific name[2]	Common name
Rubus spectabilis Pursh	Salmonberry
Rubus ursinus Cham. & Schlecht.	Trailing blackberry
Rumex crispus L.	Sour dock
Rumex conglomeratus Murr.	Clustered dock
Salix lasiandra Benth.	Red willow
Sambucus racemosa L.	Yerba buena
Saxifraga occidentalis Wats.	Redwood saxifrage
Sedum leibergii Britt.	Leiberg's sedum
**Senecio jacobaea* L.	Tansy ragwort
**Solanum dulcamara* L.	Blue bindweed
Solidago canadensis L. *v. salebrosa* (Piper) Jones	Canada goldenrod
Spiraea douglasii Hook.	Douglas spirea
**Stellaria media* L.	Common chickweed
Symphoricarpus albus (L.) Blake	Common snowberry
**Taraxacum officinale* Weber	Common dandelion
Tellima grandiflorum (Pursh) Dougl.	Alaska fringecup
Thalictrum sp.	Meadow-rice
Thuja plicata Donn	Western red cedar
Tolmiea menziesii (Pursh) T. & G.	Youth-on-age
Trientalis latifolia Hook.	Northern starflower
**Trifolium hybridum* L.	Alsike clover
**Trifolium procumbens* L.	Hop clover
Trilium ovatum Pursh	Trillium
Typha latifolia L.	Broad-leaved cattail
Urtica dioica L.	Bigsting nettle
Valerianella locusta (L.) Betcke	European corn-salad
**Verbascum blattaria* L.	Moth mullein
**Verbascum thapsus* L.	Flannel mullein
**Veronica filiformis* Sm.	Thread-stalk speedwell
Veronica americana Schwein.	American brooklime
Viburnum ellipticum Hook.	Oregon viburnum
Vicia americana Muhl.	American vetch
Vicia hirsuita (L.)	Hairy vetch
Viola glabella Nutt.	Wood violet
Viola langsdorfii (Regel) Fisch.	Aleutian violet
Viola septentrionalis Greene	Northern violet
Xanthium strumareum L.	Cocklebur
Cryptogams	
Antitrichia californica Sull.[3]	
Dendroalsia abietina (Hook) E.G.B.[3]	
Rhytidiadelphus triquetris	
Usnea barbata Fr. Schrad.[3]	

[1]Nomenclature follows Hitchcock and Cronquist (1976) except for the cryptogams, which follows Lawton (1971).

[2]An asterisk (*) indicates an introduced species.

[3]Identification is not positive.

Table BWI-2—Tentative list of birds of the Blackwater Islands Research Natural Area[1]

Order	Scientific name[2]	Common name	Season used[3 4]			
			Sp	S	F	W
Gaviiformes	*Gavia immer*	Common loon				r
Colymbiformes	*Aechmophorus occidentalis*	Western grebe				o
	Colymbus auritus	Horned grebe	r		o	
	Podiceps caspicus	Eared grebe			o	
	**Podilymbus podiceps*	Pied-billed grebe	u	u	u	o
Pelecaniformes	*Pelecanus erythrorhynchos*	White pelican	r			
	Phalacrocorax auritus	Doubled-crested cormorant	o			o
Ciconiiformes	*Ardea herodias*	Great blue heron	c	c	c	o
	Butorides virescens	Green heron	o	o	o	o
	Casmerodius albus	Common (or great) egret	r	r	o	r
	Nycticorax nycticorax	Black crowned night heron				
	**Botaurus lentiginosus*	American bittern	o	u	u	
Anseriformes	*Olor columbianus*	Whistling swan	u	r	c	a
	Olor buccinator	Trumpeter swan				
	Anser albifrons	White-fronted goose	u	r	r	o
	**Branta canadensis*	Canada goose	c	u	c	a
	Chen hyperborea	Snow goose	o		o	r
	**Anas platyrhynchos*	Mallard	a	c	a	a
	**Anas strepera*	Gadwall	u	u	u	u
	**Anas acuta*	Pintail	c	u	c	a
	**Anas carolinensis*	Green-winged teal (European variety)	c	u	c	c r
	**Anas discors*	Blue-winged teal	u	u	c	r
	**Anas cyanoptera*	Cinnamon teal	u	u	c	c
	Mareca penelope	European wigeon	o		u	u
	**Mareca americana*	American wigeon	a	u	a	a
	**Spatula clypeata*	Northern shoveler	c	u	c	c
	**Aix sponsa*	Wood duck	u	u	u	o
	Aythya americana	Redhead				o
	Aythya collaris	Ring-necked duck	o		o	o
	Aythya valisineria	Canvasback	r		o	r
	Aythya marila	Greater scaup	r			o
	Aythya effinis	Lesser scaup	o	r	u	o
	Bucephala clangula	Common goldeneye	o		r	o
	Bucephala islandica	Barrow's goldeneye				r
	Bucephala albeola	Bufflehead	o		o	o
	Histrionicus histrionicus	Harlequin duck		x		
	Oxyura jamaicensis	Ruddy duck	u	o	u	u
	**Lophodytes cucullatus*	Hooded merganser	o	o	o	
	Mergus merganser	Common merganser	o		o	u

Table BWI-2—Tentative list of birds of the Blackwater Islands Research Natural Area[1]—Continued

Order	Scientific name[2]	Common name	Season used[3 4]			
			Sp	S	F	W
Falconiformes	*Cathartes aura*	Turkey vulture	u	u	u	
	Accipiter gentilis	Goshawk	r			
	Accipiter striatus	Sharp-shinned hawk		r		
	Accipiter cooperi	Cooper's hawk		r		
	**Buteo jamaicansis*	Red-tailed hawk	c	c	c	c
	Buteo lagopus	Rough-legged hawk	r			
	Aquila chrysaetos	Golden eagle	r	r		r
	Haliaeetus leucocephalis	Bald eagle	u	r	o	u
	**Circus cyaneus*	Marsh hawk	o	u	o	o
	Pandion haliaetus	Osprey	r	o		r
	Falco mexicanus	Prairie falcon			x	
	Falco columbarius	Pigeon hawk (Merlin)	r			
	**Falco sparvarius*	American kestrel	c	u	u	u
Galliformes	*Bonasa umbellus sabini* (Douglas)	Oregon ruffed grouse	r	r	r	r
	Lophortyx californicus	California quail	r	r	r	r
	**Phasianus colchicus*	Ringed-necked pheasant	u	u	u	u
Gruiformes	*Grus canadensis*	Sandhill crane	o	o	u	o
	**Rallus limicola*	Virginia rail	o	o	o	o
	**Fulica americana*	American coot	c	u	c	a
Charadriiformes	*Charadrius semipalmatus*	Semipalmated plover		r		
	**Charadrius vociferus*	Killdeer	c	c	a	a
	**Capella gallinago*	Common snipe	a	a	a	u
	Numenius phaeopus	Whimbrel	r			
	Actitis macularia	Spotted sandpiper	o	o		
	Tringa solitaria	Solitary sandpiper	r	r		
	Totanus melanoleucus	Greater yellowlegs		o	o	o
	Totanus flavipes	Lesser yellowlegs	o	o	o	
	Erolia melanotos	Pectoral sandpiper			o	
	Erolia bairdii	Baird's sandpiper		o	o	
	Erolia minutilla	Least sandpiper	u	o	o	
	Erolia alpina	Dunlin	c		u	
	Limnodromus scolopaceus	Long-billed dowitcher	o		o	r
	Micropalama himantopus	Stilt sandpiper		r	r	
	Ereunetes mauri	Western sandpiper	o	r		
	Crocethia alba	Sanderling		r	r	
	**Steganopus tricolor*	Wilson's phalarope	o	o		o
	Lobipes lobatus	Northern phalarope	o	o		
	Larus hyperboreus	Glaucous gull	x			
	Larus glaucescens	Glaucous-winged gull				o
	Larus argentatus	Herring gull	o	o	o	u

Table BWI-2—Tentative list of birds of the Blackwater Islands Research Natural Area[1]—Continued

Order	Scientific name[2]	Common name	Season used[3 4]			
			Sp	S	F	W
	Larus californicus	California gull	o	o	o	u
	Larus delawarensis	Ring-billed gull	o	o	o	o
	Larus canus	Mew gull			o	
	Larus philadelphia	Bonaparte's gull		r	r	
	Sterna hirundo	Common tern	r			
Columbiformes	**Columba fasciata*	Band-tailed pigeon	o	u	o	o
	Columba livia	Rock dove	o	o	o	o
	**Zenaidivia macroura*	Mourning dove	u	c	u	o
Strigiformes	*Tytoalba*	Barn owl	r	r	r	r
	**Otus asio*	Screech owl	u	u	u	o
	**Bubo virginianus*	Great horned owl	u	u	u	u
	Nyctea scandiaca	Snowy owl				r
	Asio flammenus	Short-eared owl				r
Micropodiformes	*Selasphorus rufus*	Rufous hummingbird	u	u	o	r
Coraciiformes	*Megaceryle alcyon*	Belted kingfisher	u	u	u	u
Piciformes	**Colaptes cafer*	Red-shafted flicker	c	c	c	c
	Dryocopus pileatus	Pileated woodpecker			o	o
	Asyndesmus lewis	Lewis's woodpecker	o		o	o
	Sphyrapicus varius	Yellow-bellied sapsucker	o		o	o
	Dendrocopos villosus	Hairy woodpecker	o	o	o	o
	**Dendrocopos pubescens*	Downy woodpecker	u	u	u	u
Passeriformes	*Tyrannius tyrannus*	Eastern kingbird	r			
	Tyrannus verticalis	Western kingbird	r			
	Sayornis saya	Say's phoebe				x
	Empidonax difficilis	Western flycatcher	o	o		r
	**Contopus sordidulus*	Western wood peewee	u	u	u	
	**Tachycineta thalassina*	Violet-green swallow	c	o	u	r
	**Iridoprocne bicolor*	Tree swallow	a	c	c	r
	Stalgidopteryx ruficollis	Rough-winged swallow	o	o		
	**Hirundo rustica*	Barn swallow	c	c	c	r
	**Petrochelidon pyrrhonsta*	Cliff swallow	a	c	u	
	Progne subis	Purple martin		r		
	Perisoreus canadensis	Gray jay	r			r
	Cyanocitta stelleri	Steller's jay	u	u	u	u
	**Aphelocoma coerulescens*	Scrub jay	u	u	u	c
	Pica pica	Black-billed magpie		r	r	
	Corvus brachythynchos	Common crow	c	u	c	c
	**Parus artricapillus*	Black-capped chickadee	c	c	c	a
	Parus rufescens	Chestnut-backed chickadee	o	o	o	o
	**Pealtriparus minimus*	Common bushtit	u	u	u	u

Table BWI-2—Tentative list of birds of the Blackwater Islands Research Natural Area[1]—Continued

Order	Scientific name[2]	Common name	Season used[3] [4]			
			Sp	S	F	W
	**Sitta carolenensis*	White-breasted nuthatch	c	u	u	u
	Sitta canadensis	Red-breasted nuthatch	o	o	o	o
	**Certhia familiaris*	Brown creeper	o	o	o	o
	Troglodytes aedon	House wren	o	o		
	Troglodytes troglodytes	Winter wren	u		o	o
	**Thryomanes bewickii*	Bewick's wren	c	c	c	c
	Telmatodytes palustris	Long-billed marsh wren			r	r
	**Turdus migratorius*	American robin	c	c	c	c
	Ixoreus naevius	Varied thrush	c	o	u	a
	Hylocichla guttata	Hermit thrush				r
	Hylocichla ustulata	Swainson's thrush			o	
	Sialia mexicana	Western bluebird				r
	**Regulus starapa*	Golden-crowned Kinglet	c	c	c	c
	Regulus calendula	Ruby-crowned Kinglet	o		o	o
	Motacilla flava	Yellow wagtail			x	
	**Anthus spinoletta*	Water pipit	c	u		
	**Bombycilla cedrorum*	Cedar waxwing	u	u	u	u
	Lanius excubitor	Northern shrike	o		u	o
	Lanius Ludovicianus	Loggerhead shrike				
	**Sturnus vulgaris*	Starling	a	a	a	c
	Vireo huttoni	Hutton's vireo				o
	Vireo olivaceus	Red-eyed vireo				
	**Vireo gilvus*	Warbling vireo	u	u	o	
	**Vermivora celata*	Orange-crowned warbler	u	o		
	Vermivora ruficapilla	Nashville warbler	r			
	Dendroica petchia	Yellow warbler	o	o	o	r
	**Dendroica audubonі*	Yellow-rumped warbler	a	u	o	c
	Dendroica nigrescens	Black-throated gray warbler		r		
	Dendroica townsendi	Townsend's warbler				o
	Oporornis tolmiei	MacGillivrays warbler		r		
	Geothlypis trichas	Yellowthroat	o			
	Icteria virens	Yellow-breasted chat	o	o		
	Wilsonia pusilla	Wilson's warbler	o			
	**Passer domesticus*	House sparrow	u	u	u	u
	**Sturnella neglecta*	Western meadowlark	u	o	u	o
	Xanthocephalus xanthocephalus	Yellow-headed blackbird	o	o		
	**Agelaius phoeniceus*	Red-winged blackbird	a	c	c	a
	**Icterus bullockii*	Bullock's oriole	u	u	o	
	**Euphagus cyanocephalus*	Brewer's blackbird	c	c	c	c
	**Molothrus ater*	Brown-headed cowbird	o	o		
	**Piranga ludoviciana*	Western tanager	o	o		

Table BWI-2—Tentative list of birds of the Blackwater Islands Research Natural Area[1]—Continued

Order	Scientific name[2]	Common name	Season used[3] [4]			
			Sp	S	F	W
	**Pheucticus melanocephalus*	Black-headed grosbeak	o	o		
	Hesperiphona vespertina	Evening grosbeak	o			o
	**Carpodacus purpureus*	Purple finch	c	c	c	c
	**Carpodacus mexicanus*	House finch	c	c	c	c
	Acanthis flammea	Common redpoll	x			
	Spinus pinus	Pine siskin	o			
	**Spinus tristis*	American goldfinch	a	c	c	o
	Loxia curvirostra	Red crossbill	o			
	Pipilo erythrophthalmus	Rufous-sided towhee	u	u	u	u
	Pipilo fuscus	Brown towhee	x			
	**Passerculus sandwishensis*	Savannah sparrow	a	a	u	
	**Junco oreganus*	Oregon junco	a	c	c	a
	Spizella passerina	Chipping sparrow	u	o	o	
	Zonotrichia querula	Harris' sparrow				x
	**Zonotrichia leucophrys*	White-crowned sparrow	c	u	u	u
	**Zonotrichia atricapilla*	Golden-crowned sparrow	o	o	o	u
	**Passerella iliaca*	Fox sparrow	o	o		
	Melospiza lincolnii	Lincoln's sparrow	o		o	o
	**Melospiza melodia*	Song sparrow	c	c	c	c

[1]List courtesy of Ridgefield National Wildlife Refuge. The 175 species listed have been sighted in the Refuge, within which is located the Blackwater Island RNA. The list is based on information available through 1975. Other species may use the Refuge occasionally. Confirmed sightings of species not listed should be reported to the Refuge Manager, 210 N. Main Street, Ridgefield, WA 98642 (telephone 206/887-4071). Sightings of listed species outside seasons indicated should also be reported.

[2]An asterisk (*) indicates a species known to nest in the Refuge.

[3]Symbols for seasons:
Sp = spring (March-May)
S = summer (June-August)
F = fall (September-November)
W = winter (December-February)

[4]Symbols for abundance of species:
a = abundant
b = common; certain to be seen in proper habitat
u = uncommon; present but not certain to be seen
o = occasionally seen
r = rarely seen (intervals of 2-5 years)
x = accidental, outside of normal range

Table BWI-3—Tentative list of mammals of the Blackwater Islands Research Natural Area[1]

Order	Scientific name	Common name
Marsupialia	*Didelphis marsupialis*[2]	Opossum
Insectivora	*Neurotrichus gibbsi*	Shrew-mole
	Scapanus townsendi[2]	Townsend mole
	Sorex vagrans	Wandering shrew
Chiroptera	*Eptesicus fuscus*	Big brown bat
	Lasionycteris noctivagans	Silver-haired bat
	Lasiurus cinereus	Hoary bat
	Myotis californicus	California myotis
	Myotis evotis	Long-eared myotis
	Myotis lucifugus	Little brown myotis
	Myotis thysanodes	Fringed myotis
	Myotis yumanensis	Yuma myotis
	Plecotus townsendi	Townsend big-eared bat
Lagomorpha	*Sylivagus floridanus*[2]	Eastern cottontail
Rodentia	*Castor canadensis*[2]	Beaver
	Eutamias townsendi	Townsend chipmunk
	Microtus oregoni	Oregon or creeping vole
	Microtus townsendi[2]	Townsend vole
	Myocastor coypus[2]	Nutria
	Neutoma cinerea	Bushy-tailed woodrat
	Ondatra zibethicus	Muskrat
	Peromyscus maniculatus[2]	Deer mouse
	Sciurus griseus	Western gray squirrel
	Spermophilus beecheyi	California ground squirrel
	Tamiasciurus douglasi	Chickaree
Carnivora	*Canis latrans*[2]	Coyote
	Lutra canadensis	Otter
	Lynx rufus	Bobcat
	Mephitis mephitis	Striped skunk
	Mustela frenata	Long-tailed weasel
	Mustela vison	Mink
	Procyon lotor[2]	Raccoon
	Spilogale putorius	Spotted skunk
	Urocyon cinereoargenteus	Gray fox
Artiodactyla	*Odocoileus hemoinus columbianus*[2]	Black-tailed deer

[1]Nomenclature follows Burt and Grossenheider (1976).

[2]Presence of mammal has been verified by sign, sighting, or hearing.

History of Disturbance

Aside from annual flooding, the major disturbance on the RNA has been from cattle grazing. Grazing pressure has historically been heavy but has been reduced considerably since 1965 when the Wildlife Refuge was established. Lands within the RNA have received the least grazing pressure, but even these are still accessible to cattle during the periods of low water.

Research

The only research conducted on the Blackwater Island RNA has been the development of a vegetation description by an undergraduate student in environmental studies from Portland State University (see footnote 7). A copy of the description can be obtained from the Refuge Manager.

The RNA presents a unique opportunity to study succession, zonation, and the effect of annual flooding on the willow-oak-ash riparian community of the lower Columbia River.

Maps and Aerial Photographs

Special maps applicable to the RNA include: Topography-7.5' St. Helens, Oregon-Washington, quadrangle, scale 1:24,000, issued by the U.S. Geological Survey in 1954, photo revised in 1970; and *Geology-Geologic Map of Washington,* scale 1:500,000 (Huntting et al. 1969). The Manager of the Ridgefield National Wildlife Refuge can provide information on the most recent aerial photos and forest type maps for the area.

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