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Baseline Bio-Inventory and Conservation Assessment for the Moorecroft Camp Property, Nanoose

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Prepared for:
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**Baseline Bio-Inventory and Conservation Assessment for the
Moorecroft Camp Property, Nanoose British Columbia**

EXECUTIVE SUMMARY

Moorecroft Camp is a 34 ha (85 acre) property comprised of coastal shoreline, wetland/riparian areas, and upland forest on the northeast coast of the Nanoose Bay Peninsula. It is owned and operated by the United Church of Canada (UCC), which operates the site as a retreat and educational camp. Recent interest by the UCC in selling the property has prompted the Moorecroft Camp Society to enlist the assistance of the Nanaimo and Area Land Trust (NALT) in mounting a campaign to preserve the site. NALT, in turn, has retained Ursus Environmental to perform a baseline environmental inventory of the site and to provide an objective assessment of its ecological values.

The primary objectives of this assignment were to:

- 1) Compile and review existing information sources;
- 2) Ground-truth plant communities to confirm Sensitive Ecosystem Inventory (SEI) classification and boundaries;
- 3) Prepare a plant list and natural features map for the site;
- 4) Conduct wildlife surveys and reconnaissance, with special reference to potential use by Red- and Blue-listed wildlife; and
- 5) Assess the regional importance of vegetation and wildlife resources

Surveys to inventory the flora and fauna of the property were conducted between late May and late July of 2007. The fieldwork ranged from reconnaissance level inspections to formal surveys following Provincial government protocols. Seasonal gaps in the field program were addressed through interviews with knowledgeable members of the local naturalist community.

Based on the material compiled and reviewed, it is our assessment that the Moorecroft Camp property possesses a high overall conservation value. The site rated high or very high for plant diversity (145 native species recorded), vertebrate diversity (at least 98 species noted), and importance to “At-risk” or uncommon wildlife.

Regarding the latter, it was determined that Skipsey Lake is a probable breeding area for Blue-listed Red-legged Frog, while adjacent forest likely serves as “core” habitat for this species. Currently, activity of the Blue-listed Great Blue Heron at the site appears restricted to foraging. However, the site was assessed as having a high potential to support heron nesting in the future, particularly as development proceeds in neighbouring areas. In addition to the these listed species, Moorecroft Camp was also found to support nine other bird species that are considered “uncommon or localized” in the Nanaimo - Parksville corridor.

Although no rare or threatened plants were found at the site, it includes several habitat types (e.g. wetlands, rock outcrops, seaspray zones) that may support such plants, and was therefore assigned a moderate rating on this component. The site rates moderately high for capture of sensitive or under-represented ecosystems. It contains two designated SEI Polygons, a Coastal Bluff and a Wetland unit. Seven other areas of the site were found to meet the criteria for SEI designation, including two new Wetland units, two new Riparian units, a new Sparsely Vegetated unit, and a new Coastal Bluff unit.

The following recommendations were offered to protect the key natural resource values of the Moorecroft Camp property:

1. Given the on-going loss and degradation of SEI Polygons units in southeast Vancouver Island, all sensitive ecosystems within the Moorecroft Camp property should be mapped using a differential GPS unit, protected by a buffer of natural vegetation at least 15 m in width, and secured within a conservation covenant.
2. The boundaries of SEI Polygon #N0350C should be expanded to include the surrounding swamp land, while those of SEI Polygon #N0329A should be expanded to the northern property line.
3. New Sensitive Ecosystem units should be designated for the Woodland habitat in the Southeast corner of the site, and the Wetland/Riparian complexes in the east-central and northwest parts of the site.
4. “Core” habitat for the Blue-Listed Red-legged Frog, (and potential nesting habitat for Great Blue Herons) within 200 m of the high wetted perimeter of SEI Polygon #N0350 should be protected within a conservation covenant. Any new road crossings through this area should incorporate amphibian passage tunnels and lead/exclusion fencing to reduce the potential for amphibian road-kills.
5. A buffer of natural vegetation measuring at least 45 m in radius (1.5 tree lengths) should be retained around the Bald Eagle nest tree near the northern property line, and covenanted.
6. Habitat linkages should be maintained between SEI Polygon #N0350 and the newly-identified west-central swamp unit.
7. No clearing or disturbance should occur around the Sitka Spruce tree in the west-central part of the property, or the Douglas-fir tree serving as a Bald Eagle perch tree in the north-central part of the site.

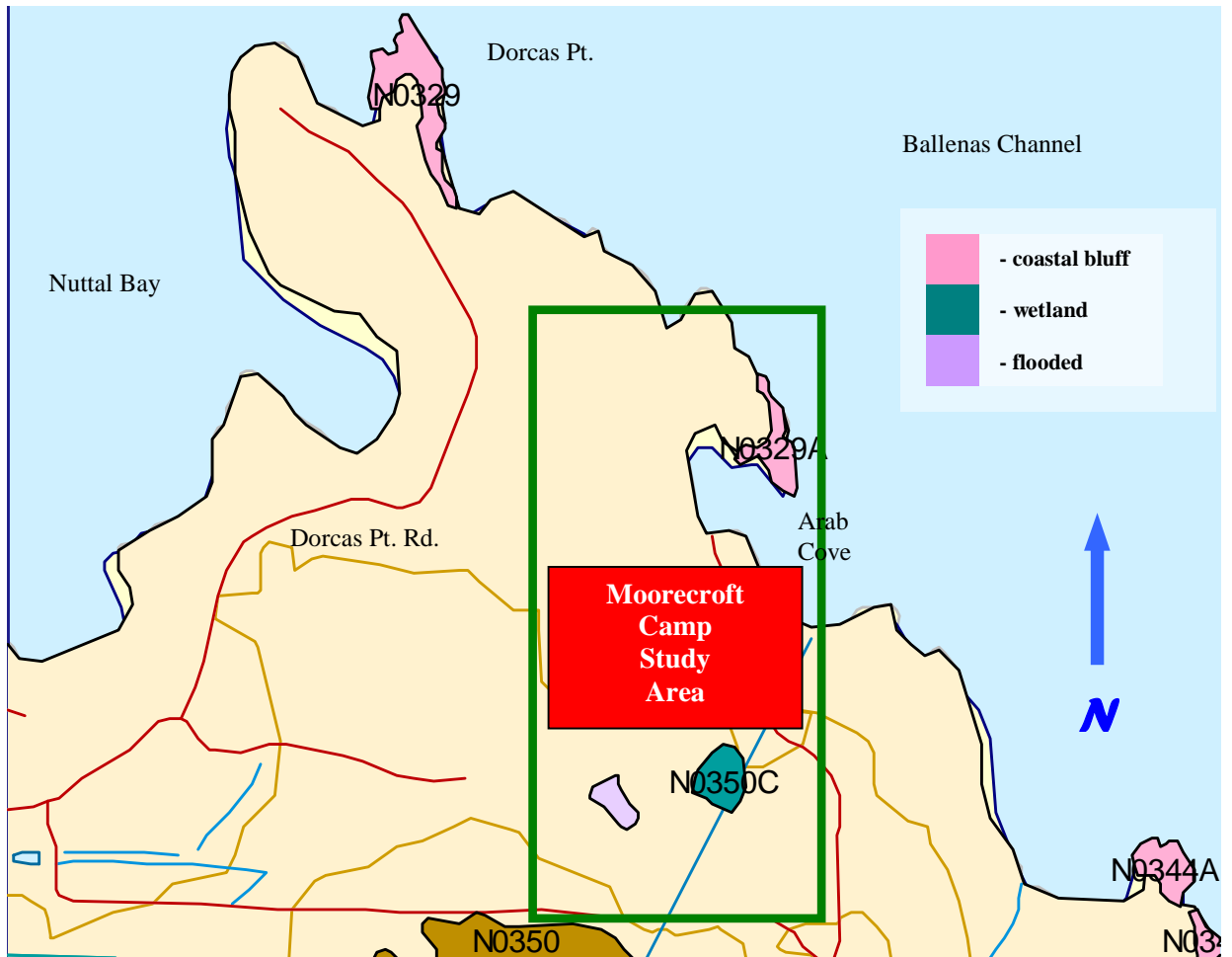


Figure 1. Study Area overview showing mapped SEI polygons in the region.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Moorecroft Camp Conservation Values

Based on the material compiled and reviewed, it is our assessment that the Moorecroft Camp property possesses a high overall conservation value. A breakdown of the site's importance with respect to individual Valued Ecosystem Components is provided in Table 5 below.

Table 5. Regional Importance ratings of the Moorecroft Camp property for selected VEC's.

Valued Ecosystem Component	Regional Importance Rating	Rating Rationale
1. Vascular Plant Diversity	Very High	- over 145 native plant species recorded.
2. Capture of Rare / Threatened Plants	Moderate	- no Red- or Blue-listed plants observed on site, but includes several habitats which may support rare plants.
3. Capture of Sensitive / Under-represented Plant Communities	Moderate-High	- contains 2 designated SEI Polygons (CB & WN units). 7 others meet SEI criteria, including 2 WN units; 2 RI units, 1 SV unit, and 1 CB unit.
4. Importance to "At-risk" & Regionally Uncommon Wildlife	High	- Skipsey Lk probable breeding area for Blue-listed frog; adj. forest "core" Red-legged frog habitat; high potential for heron nesting. Supports 9 bird species considered "uncommon or localized".
5. Faunal Diversity	High	- 83 birds, 9 mammals, 4 amphibians and 2 reptiles noted on or near site. At least 3 other mammals, 1 other amphibian and 1 reptile are expected to occur there.
6. Landscape-Level Connectivity	Moderate	- site provides shoreline-to-upland, and wetland-to-wetland habitat linkages. With neighbouring Forest Reserve Lands, considerable potential to serve as part of a regional network of natural areas.
Overall Conservation Value	High	

6.2 Recommendations

At the time of writing, the fate of the Moorecroft Camp property was in question. If the campaign to preserve the site in its entirety proves to be unsuccessful, the following recommendations are offered to protect its key natural resource values.

1. Given the on-going loss and degradation of SEI Polygons units in southeast Vancouver Island, all sensitive ecosystems within the Moorecroft Camp property should be mapped using a differential GPS unit, protected by a buffer at least 15 m in width, and secured within a conservation covenant.
2. The boundaries of SEI Polygon #N0350C should be expanded to include the surrounding swamp land (WN: sp) as indicated in Figure 5 of this report.
3. The boundaries of SEI Polygon #N0329A should be expanded to the northern property line as indicated in Figure 5.
4. New Sensitive Ecosystem units should be designated for the Woodland habitat in the Southeast corner of the site, and the Wetland/Riparian complexes in the east-central and northwest parts of the site (see Figure 5).
5. “Core” habitat for the Blue-Listed Red-legged Frog, (and potential nesting habitat for Great Blue Herons) within 200 m of the high wetted perimeter of SEI Polygon #N0350 should be protected from development by inclusion in a conservation covenant. Any new roads crossing through this area should require amphibian passage tunnels and lead/exclusion fencing to reduce the potential for amphibian road-kills.
6. A buffer of natural vegetation measuring at least 45 m in radius (1.5 tree lengths) should be retained around the Bald Eagle nest tree near the northern property line and covenanted.
7. Habitat linkages should be maintained between SEI Polygon #N0350 and the west-central swamp unit shown on Figure 5.
8. No clearing or disturbance should occur around the Sitka Spruce tree in the west-central part of the property, or the Douglas-fir tree serving as a Bald Eagle perch tree in the north-central part of the site.

APPENDIX A

Summary of Vegetation Observed at Moorecroft Camp, Nanoose BC.

<i>Latin Name</i>	Common Name	Observations	
		Ursus	Gray
TREES (15 species)			
<i>Abies grandis</i>	Grand Fir	✓	
<i>Acer macrophyllum</i>	Big-leaf Maple	✓	✓
<i>Arbutus menzesii</i>	Arbutus	✓	✓
<i>Malus fusca</i>	Pacific Crabapple	✓	
<i>Picea monticola</i>	Western White Pine	✓	✓
<i>Picea sitchensis</i>	Sitka Spruce	✓	✓
<i>Pinus contorta</i> var. <i>latifolia</i>	Lodgepole Pine	✓	✓
<i>Populus balsamifera</i> ssp. <i>tricarpa</i>	Black Cottonwood	✓	
<i>Populus tremuloides</i>	Trembling Aspen		✓
<i>Prunus emarginata</i>	Bitter Cherry	✓	
<i>Pseudotsuga menziesii</i> ssp. <i>menziesii</i>	Douglas-Fir	✓	✓
<i>Quercus garryana</i>	Garry Oak	✓	✓
<i>Rhamnus purshiana</i>	Cascara		✓
<i>Thuja plicata</i>	Western Red Cedar	✓	✓
<i>Tsuga heterophylla</i>	Western Hemlock	✓	✓
		□	
SHRUBS (32 species)			
		□	□
<i>Alnus rubra</i>	Red Alder	✓	✓
<i>Amelanchier alnifolia</i>	Saskatoon	✓	
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	✓	
<i>Arctostaphylos columbiana</i>	Hairy Manzanita		✓
<i>Arctostaphylos uva-ursi</i>	Kinnickinnick	✓	✓
<i>Cladothamnus pyroliflorus</i>	Copperbush	✓	
<i>Cornus stolonifera</i>	Red-osier Dogwood	✓	✓
<i>Cytisus scoparius</i>	Scotch Broom	✓	
<i>Gaultheria shallon</i>	Salal	✓	
<i>Holodiscus discolor</i>	Oceanspray	✓	
<i>Ilex aquifolium</i>	Holly	✓	
	Western Trumpet		
<i>Lonicera ciliosa</i>	Honeysuckle	✓	✓
<i>Lonicera hispidula</i>	Hairy Honeysuckle	✓	
<i>Mahonia aquifolium</i>	Tall Oregon Grape	✓	✓
<i>Mahonia nervosa</i>	Dull Oregon Grape	✓	✓
<i>Oemleria cerasiformis</i>	Indian Plum	✓	✓

<i>Physocarpus capitatus</i>	Pacific Ninebark	✓	✓
<i>Ribes lacustre</i>	Black Gooseberry	✓	✓
<i>Ribes sanguineum</i>	Red Flowering Currant	✓	✓
<i>Rosa gymnocarpa</i>	Baldhip Rose	✓	
<i>Rosa nutkana</i>	Nootka Rose	✓	
<i>Rubus chamaemorus</i>	Cloud Berry	✓	
<i>Rubus discolor</i>	Himalayan Blackberry	✓	✓
<i>Rubus leucodermis</i>	Blackcap Raspberry	✓	
<i>Rubus parviflorus</i>	Thimbleberry	✓	
<i>Rubus spectabilis</i>	Salmonberry	✓	
<i>Rubus ursinus</i>	Trailing Blackberry	✓	
<i>Salix lucida ssp. lasiandra</i>	Pacific Willow	✓	
<i>Sambucus racemosa ssp. pubens</i>	Red Elderberry		✓
<i>Sorbus sitchensis</i>	Sitka Mountain Ash	✓	
<i>Spiraea douglasii ssp. douglassii</i>	Hardhack	✓	
<i>Vaccinium parvifolium</i>	Red Huckleberry	✓	
		□	
FERNS (5 species)		□	□
<i>Athyrium filix-femina</i>	Lady Fern	✓	
<i>Blechnum spicant</i>	Deer Fern	✓	
<i>Dryopteris expansa</i>	Spiny Wood Fern	✓	
<i>Polystichum munitum</i>	Sword Fern	✓	
<i>Pteridium aquilinum</i>	Bracken Fern	✓	
HERBS (108 species)		□	□
<i>Achillea millefolium</i>	Yarrow	✓	✓
<i>Achlys triphylla</i>	Vanilla Leaf	✓	✓
<i>Adenocaulon bicolor</i>	Pathfinder	✓	
<i>Agrostis capillaris</i>	Colonial Bentgrass	✓	
<i>Agrostis exarata</i>	Spike Bentgrass	✓	
<i>Allium acuminatum</i>	Hooker's Onion		✓
<i>Allium cernuum</i>	Nodding Onion	✓	
<i>Ananphalis maragritacea</i>	Pearly Everlasting	✓	
<i>Antennaria microphylla</i>	Rosy Pussytoes		✓
<i>Anthoxanthum odoratum</i>	Sweet Vernalgrass	✓	
<i>Aquilegia formosa</i>	Red Columbine	✓	✓
<i>Aster sp.</i>	Aster		✓
<i>Bellis perennis</i>	English Daisy	✓	
<i>Boschniakia sp.</i>	Groundcone		✓
<i>Camassia quamash</i>	Common Camas		✓

<i>Campanula rotundifolia</i>	Common Harebell	✓	✓
<i>Campanula scouleri</i>	Scouler's Harebell	✓	
<i>Cardamine oligosperma</i> or <i>occidentalis</i>	Bittercress	✓	
<i>Carex obnupta</i>	Slough Sedge	✓	
<i>Carex sp.</i>	Sedge	✓	
<i>Cerastium arevense</i>	Field Chickweed	✓	✓
<i>Chimaphila umbellata</i>	Princes Pine	✓	
<i>Circaea alpina</i>	Enchanter's-Nightshade	✓	
<i>Cirsium arvense</i>	Canada Thistle	✓	
<i>Cirsium edule</i>	Edible Thistle	✓	
<i>Claytonia perfoliata</i>	Miner's-lettuce	✓	✓
<i>Clintonia uniflora</i>	Queens Cup		✓
<i>Coraloshiza sp.</i>	Coralroot		✓
<i>Cornus canadensis</i>	Bunchberry		✓
<i>Cynosurus echinatus</i>	Hedgehog Dogtail	✓	
<i>Daucua carota</i>	Wild Carrot		✓
<i>Delphinium menziesii</i>	Menzies' Larkspur	□	✓
<i>Deschampsia cespitosa</i> ssp. <i>beringensis</i>	Tufted Hairgrass	✓	
<i>Dicentra formosa</i>	Pacific Bleeding Heart		✓
<i>Digitalis purpurea</i>	Foxglove	✓	
<i>Elymus mollis</i>	Dunegrass	✓	
<i>Epilobium angustifolium</i>	Fireweed	✓	
<i>Epilobium minutum</i>	Small Flowered Willowherb	✓	
<i>Epilobium ciliatum</i>	Purple-leaved Willowherb	✓	
<i>Equisetum arevense</i>	Common Horsetail	✓	
<i>Equisetum hyemale</i>	Scouring-rush	✓	
<i>Erythronium oregonum</i>	White Fawn Lily		✓
<i>Festuca occidentalis</i>	Western Fescue	✓	
<i>Fragaria chiloensis</i>	Coastal Strawberry	✓	✓
<i>Fritillaria camschatcensis</i>	Northern Rice Root		✓
<i>Fritillaria lanceolata</i>	Columbia Lily		✓
<i>Galeopsis tetrahit</i>	Hemp-Nettle	✓	✓
<i>Galium aparine</i>	Cleavers	✓	
<i>Galium triflorum</i>	Sweet scented Bedstraw	✓	✓
<i>Geranium molle</i>	Dovefoot Geranium	✓	✓
<i>Geranium robertianum</i>	Herb-Robert	✓	✓
<i>Geum macrophyllum</i>	Large-leaved Avens	✓	✓
<i>Goodyera oblongifolia</i>	Rattlesnake-plantain	✓	✓
<i>Grindelia integrifolia</i>	Entire-leaved Gumweed	✓	
<i>Heuchera micrantha</i>	Small Flowered Alumroot	✓	✓

<i>Hieracium albiflorum</i>	White- flowered Hawkweed	✓	
<i>Holcus lanatus</i>	Common Velvet-grass	✓	
<i>Hypochaeris radicata</i>	Hairy Cat's-Ear	✓	
<i>Iris pseudoacorus</i>	Yellow-flowered Iris	✓	
<i>Juncus ensifolius</i>	Dagger-leaved Rush	✓	
<i>Lactuca muralis</i>	Wall Lettuce	✓	
<i>Lathyrus japonicus</i>	Beach Pea	✓	
<i>Lathyrus nevadensis</i>	Purple Peavine	✓	
<i>Lomatium utriculatum</i>	Spring-gold		✓
<i>Lomium nudicale</i>	Indian Consumption Plant	✓	
<i>Luzula parviflora</i>	Small-flowered Wood-rush	✓	
<i>Lysichiton americanum</i>	Skunk Cabbage	✓	
<i>Maianthemum dilatatum</i>	False Lily-of-the-valley		✓
<i>Mentha arvensis</i>	Field Mint		✓
<i>Mimulus guttatus</i>	Yellow Monkey-flower	✓	✓
<i>Monotropa uniflora</i>	Indian Pipe		✓
<i>Montia parvifolia</i>	Small-leaved Montia	✓	✓
<i>Myosotis laxa</i>	Small Flowered Forget-me-not	✓	
<i>Opuntia fragilis</i>	Brittle Pricky-Pear Cactus		✓
<i>Orobanche uniflora</i>	Naked Broomrape		✓
<i>Plantago lanceolata</i>	Ribwort	✓	✓
<i>Plantago major</i>	Common Plantain	✓	✓
<i>Plantago maritima ssp. juncooides</i>	Sea Plantain	✓	✓
<i>Plectritis congesta</i>	Sea Blush	✓	✓
<i>Polygonum douglasii</i>	Douglas' Knotweed		✓
<i>Prunella vulgaris</i>	Self Heal	✓	✓
<i>Ranunculus occidentalis</i>	Western Buttercup	✓	✓
<i>Ranunculus repens</i>	Creeping Buttercup	✓	✓
<i>Rumex acetosella</i>	Sheep Sorrel	✓	
<i>Rumex occidentalis</i>	Curled Dock	✓	✓
<i>Salicornia virginica</i>	American Glasswort	✓	✓
<i>Sanicula crassicaulis</i>	Pacific Sanicle	✓	
<i>Satureja douglasii</i>	Yerba Buena	✓	✓
<i>Saxifraga sp.</i>	Saxifrage		✓
<i>Scutellaria galericulata</i>	Marsh Skullcap	□	
<i>Sedum sp.</i>	Stonecrop		✓
<i>Sisyrinchium idahoense var. macounii</i>	Blue-eyed-grass		✓
<i>Stachys cooleyae</i>	Cooley's Hedge-nettle	✓	
<i>Stachys mexicana</i>	Mexican Hedge-Nettle	✓	
<i>Symphoricarpos albus</i>	Snowberry	✓	✓

<i>Taraxacum officinale</i>	Common Dandelion	√	
<i>Tellima grandiflora</i>	Fringecup	√	√
<i>Tiarella trifoliata</i>	Foamflower	√	√
<i>Tolmiea menziesii</i>	Piggy-back Plant		√
<i>Trientalis latifolia</i>	Broad-leaved Starflower	√	√
<i>Trillium ovatum</i>	Western Trillium		√
<i>Typha latifolia</i>	Cattail	√	
<i>Urtica dioica</i>	Stinging Nettle	√	√
<i>Veronica beccabunga ssp. americana</i>	American Brooklime	√	
<i>Vicia americana</i>	American Vetch	√	
<i>Viola sp.</i>	Violets		√
<i>Zygadenus venenosus</i>	Meadow Death-Camas		√
	Grass sp	√	√

APPENDIX D

Summary of Wildlife Observations at Moorecroft Camp, Nanoose BC.

Species	Observed			Comments
	Ursus	Gray	Harrison	
BIRDS (83 species)				
American goldfinch			√	A few may over-winter here.
American robin	√		√	Widespread and abundant thrush.
American widgeon			√*	*Small winter flocks around Arab Cove
Bald eagle	√	√	√	Nest north end of site.
Band-tailed pigeon	√			
Barred owl	√	√	√	Probably nests in SW corner
Barrow's goldeneye			√	Wintering only
Belted kingfisher			√*	*Common in Arab Cove area
Bewick's wren	√		√	Common resident nesting in shrubs.
Black oystercatcher			√*	*Common in Arab Cove area
Black scoter			√*	*Occasional in SurfScoter raft
Black turnstone			√*	*Common on shoreline roskc with Surfbirds

Black-bellied plover			√*	*Shoreline rocks
Black-throated gray warbler	√			
Brandt's cormorant			√*	*Winter offshore good location for them
Brant			√*	*Winter offshore
Brown creeper	√		√*	*Common resident
Bufflehead			√	Wintering only, nest in BC Interior.
Bushtit			√*	*Resident
Canada goose			√*	*In Arab Cove
Caspian Tern			√*	*Offshore in fall
Cassin's vireo	√		√*	*Summer visitor
Cedar waxwing				A few may over-winter in region.
Chestnut-backed chickadee	√		√	Cavity-nester.
Common goldeneye			√	Wintering only
Common loon			√	Wintering only
Common merganser			√*	*Arab Cove, mostly winter
Common murre			√*	*Offshore in winter
Common raven	√		√	Common and abundant.
Cooper's hawk		√		May forage in forest patches.
Dark-eyed junco	√		√	Common and abundant sparrow.
Double-crested cormorant			√*	*Common near & offshore, rock perches
Downy woodpecker			√*	*Resident
Fox sparrow			√*	*Common in winter
Glaucous-winged gull			√*	*Common all year, but no gull roosts or loafing areas
Golden-crowned kinglet			√	Most abundant in winter months.
Golden-crowned sparrow			√*	*Cabin area
Great blue heron			√*	*Arab Cove area yearround
Great horned owl		√	√	
Hairy woodpecker	√		√	Few suitable snags for nesting.
Harlequin duck			√	Wintering only
Hermit thrush			√*	*Good spot for them in winter
Horned grebe			√	Wintering only
House finch			√	Common resident
Killdeer			√*	*Arab Cove
Mallard			√	Nest in forests near open water.
Northern flicker	√		√	Common woodpecker in region.
Northern pygmy owl		√		
Northwestern crow	√		√*	*Large roost on Gerald II across from Moorecroft
Orange-crowned warbler	√		√	Summer visitant
Pacific loon			√*	*Winter offshore
Pacific-slope flycatcher	√		√	Summer visitant in coniferous forest.

Pelagic cormorant			√*	*Common near & offshore, rock perches
Pied-billed grebe			√*	*Arab Cove- 1 record
Pigeon guillemot			√*	*Common offshore all winter
Pileated woodpecker	√		√	Feeding excavations seen on logs.
Pine siskin			√	Irruptive, follows large cone crops.
Purple finch	√		√	
Red-breasted merganser			√	Wintering only
Red-breasted nuthatch	√		√	Cavity-nester.
Red-breasted sapsucker	√		√	Cavity nester, generally lg. stems
Red-necked grebe			√	Wintering only
Red-winged blackbird	√		√	Winters in region, breeds in marshes.
Rock sandpiper			√*	*Shoreline below Moss Hill & SE of Arab Cove. Rare.
Ruby-crowned kinglet			√*	*Resident, mostly winter
Ruffed grouse				Mixed woodlands
Rufous hummingbird	√		√	Summer visitant
Sharp-shinned Hawk		√	√*	*May nest
Song sparrow	√		√	Common in and around wetlands.
Spotted towhee	√		√	Common resident species.
Steller's jay			√	More abundant in winter.
Surfbird			√*	*Shoreline rocks
SurfScoter			√*	*Small rafts offshore winter
Swainson's thrush	√		√	Summer visitant
Thayer's gull			√*	*Winter
Townsend's warbler	√		√	Summer visitant of upland forests.
Tree swallow			√*	*Clayton Cres area
Turkey vulture	√		√*	*Fly over
Varied thrush			√	Mostly over-winters here.
Violet-green swallow			√	Summer visitant
Western tanager				Summer visitant in coniferous forest.
White-crowned sparrow	√		√	
White-winged scoter			√*	*Small winter rafts offshore
Willow flycatcher	√		√	
Winter wren	√		√	Common in mesic forests.
Yellow warbler				Summer visitant of riparian habitats.
Yellow-rumped warbler	√		√	Summer visitant: late migration
MAMMALS (9 species)				
Beaver	√	√		Foraging, damming evidence at wetland.
Black bear	√			Feeding sign around old stumps.
Black-tailed deer	√			Numerous tracks & droppings & beds on site.

Cougar			√*	*Local resident reports 1-2 sighting each year
Deer mouse				Widespread and abundant.
Dusky / Vagrant shrew				Higher densities in moist areas.
Eastern cottontail	√			
Mink			√	Frequents wetland margins / shallows.
Muskrat	√		√	In wetlands with high emergent cover.
Raccoon	√		√	Tracks seen around wetland margins.
Red Squirrel	√		√	Middens and cone foraging evidence. Auditory calls.
River otter	√		√	

Amphibians and Reptiles (7 species)

Common garter snake	√		√	Common around wetland margins.
Long-toed Salamander	√			Visual observation
Northern alligator lizard	√		√	Visual observation
Northwestern garter snake	√		√	Often most common snake in area.
Northwestern Salamander				
Pacific treefrog	√		√	Can breed in ephemeral ponds.
Red-legged frog	√		√	Breeds in moderately deep ponds, especially bog-type wetlands.
Rough-skinned newt	√		√	Common in open fir stands.
Western Red-backed salamander				Moist forest with high leaf litter.