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Saturna Island

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ECOLOGICAL RESERVES COLLECTION
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The Vertebrate Fauna of Three Ecological Reserves

On the Gulf Islands of British Columbia

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Species lists were compiled on the vertebrate fauna for each of the three ecological reserves on the Gulf Islands of British Columbia. Special concentration was placed on the herptile species present. Suggestions for future work on ecological reserves in general are included.

Introduction

The Ecological Reserves in British Columbia are an outgrowth of the International Biological Programme to set up projects to examine the ecological factors of biology through the conservation of selected terrestrial ecosystems. As of October, 1973, 53 ecological reserves (totaling 89,808.53 acres) had been set up to be used for research and educational studies of examples of ecosystems represented in the Province of British Columbia. Three of these reserves are on the Gulf Islands: No. 15 - Saturna Island Reserve; No. 16 - Saltspring Island Reserve; No. 37 - Saltspring Island - Mount Maxwell Reserve.

This report is based on field work conducted on the three Gulf Island reserves during the months of May through August, 1974. This work was supported by the British Columbia Department of Lands, Forests and Water Resources under the "Careers-74" Programme. The main purpose of this work was to make a species inventory of amphibians and reptiles present on the reserves. Later, during June, inventories were also started for mammals and birds. Further surveys in these areas are expected to add species to most of the inventories, especially if conducted during fall, winter and spring months when other bird species will be present and terrestrial salamanders will show themselves more readily.

It is expected that the species present on the Gulf Island Reserves are all members of the fauna found on Southern Vancouver Island, although total species diversity may be smaller on some of the Gulf Islands. More detailed surveys are needed to confirm this hypothesis. A list of

Vancouver Island herptile fauna is contained in the appendix.

Descriptions of the reserve sites are under the individual reserve reports and will be brief. It is suggested that reference be made to the vegetation report by Clare, Handly and Maingy (unpublished) for greater detail. Species lists of all vertebrates sighted on each reserve and notes on each herptile species are included.

Methods and Materials

The primary method used on the reserves and surrounding areas was "search and seek". The vertebrates were not readily visible in all parts of the reserves and if weather was overcast and wet, a day could go by without a single vertebrate being sighted.

There was a greater abundance of birds on road and meadow edges. These animals were easier to identify as there was less interference from foliage. Birds were particularly evident on sunny days and late and early in the day as they were most active at these times.

Mammals were often noted through droppings and skull identification. Occasionally, black-tailed deer (Odocoileus hemionus columbianus) or the red squirrel (Tamiasciurus hedsonicus langinosus) were seen crossing a road or in the bush. Rodents, including the white-footed mouse (Peromyscus maniculatus argustus) and Townsend's vole (Microtus townsendi tetramerus), due to their nocturnal nature, were either seen with the aid of a flashlight at night or trapped in a Tomahawk live mouse trap (#101 3x3x10 inches, Tomahawk Live Traps, Tomahawk, Wisconsin), using honey and peanut butter as bait. These traps were generally placed in meadow or rock outcropping areas or near fresh water.

Reptiles were only observed on warm days, usually while sunning themselves in open areas (e.g. outcroppings or on roadways). Amphibians were usually found near bodies of water or on moist soil and moss. The aquatic larvae were most easily located as they were completely confined to water (e.g. ponds); these were captured with a dip net. The larvae were most abundant during June and July.

Live-traps were set up along a stream course on the Saltspring Island Reserve (No. 16) using a drift fence between traps. Two types

of traps were alternated: one a funnel-type snake trap (Fitch, 1951), the other a funnel-type salamander trap (Oliver, 1974). Only the latter type yielded any captures (one adult Ambystoma g. gracile and one adult Rana a. aurora), but both traps have been successfully used in other studies (Gregory, 1971; Oliver, 1974) and are recommended for use in future surveys of these organisms.

Vertebrate Habitats

Due to the limited time of the study an intensive examination of vertebrate habitats of the reserves was not possible. However, the following types of habitats were observed:

<u>aquatic</u>	<u>terrestrial</u>
stream	outcroppings
pond	coniferous forest
marsh	arbutus forest
	oak forest
	meadow

Aquatic habitats are important to all the vertebrates because of their frequent need for water. In particular, amphibians have a constant need for moisture. At least two of the three garter snakes seem to feed on prey species, such as amphibians and slugs, which are generally found in humid or aquatic environments (Gregory, pers. comm.).

Ecological Reserve No. 16, Mount Tuam, Saltspring Island

Mount Tuam Reserve is located on the southern tip of Saltspring Island one mile west of Isabella Point. The reserve combines the western three-quarters of section 39 and the eastern half of section 32. The reserve has waterfront protection and consists of 627 acres. Most of the reserve is a forest of Douglas Fir, Arbutus and Salal, with a few areas of small rock outcroppings with moss and grass.

The main water sources in the reserve are a creek running from the top of section 39 into Satellite Channel, traversing the eastern half of section 39 from northwest to southeast, and a pond located next to Mountain Road at the eastern boundary (section 39). There are also several marsh areas that have fresh water running through them during the winter and early spring.

There are two ways of entering the reserve by road. Mountain Road traverses section 39 from just south of the northeastern corner to the southwestern corner, then moves westerly through section 32, finally heading north toward Mount Tuam. The other road leads into the southeastern corner of section 39 where the main creek flows into Satellite Channel.

Check-List of Vertebrates

Mammals - (Cowan & Guiguet, 1965)

- Tamiasciurus hudsonicus lanuginosus (Bachman). Red Squirrel.
Peromyscus maniculatus angustus (Hall). White-footed Mouse.
Mustela vison evagor (Hall). Mink.
Odocoileus hemionus columbianus (Richardson). Coast or Columbian
 Blacktail Deer.

*domestic
goat?*

Birds - (Petersen, 1961 and E. Eisenmann, 1973)

- Cathartes aura. Turkey Vulture.
Buteo jamaicensis. Red-tailed Hawk.
Haliaeetus leucocephalus. Bald Eagle.
Dendragapus obscurus. Blue Grouse.
Bonasa umbellus. Ruffed Grouse.
Lophortyx californicus. California Quail.
Larus glaucescens. Glaucous-winged Gull.
Selasphorus rufus. Rufous Hummingbird.
Colaptes cafer. Red-shafted Flicker.
Dryocopus pileatus. Pileated Woodpecker.
Sphyrapicus varius. Red Breasted Sapsucker.
Dendrocopos villosus. Hairy Woodpecker.
Cyanocitta stelleri. Steller's Jay.
Corvus corax. Common Raven.
Corvus caurinus. Northwestern Crow.
Parus rufescens. Chestnut-backed Chickadee.
Certhis familiaris. Brown Creeper.
Thryomanes bewickii. Bewick's Wren.
Turdus migratorius. American Robin.
Carpodacus purpureus. Purple Finch.

Spinus tristis. Pine Siskin.

Pipito erythrophthalmus. Rufous-sided Towhee.

Junco hyemalis oregonus. Oregon Junco.

Passerella iliaca. Fox Sparrow.

Reptiles - (Logier & Toner, 1961; Stebbins, 1966)

Thamnophis ordinoides (Baird and Girard). Northwestern Garter Snake.

Thamnophis elegans vagrans (Baird and Girard). Wandering Garter Snake.

Thamnophis sirtalis pickeringi (Carl). Puget Sound Red-sided Garter Snake.

Amphibians - (Logier & Toner, 1961)

Ambystoma gracile gracile (Baird). Brown or Northwestern Salamander.

Hyla regilla (Baird and Girard). Pacific Treefrog.

Rana aurora aurora (Baird and Girard). Northern Red-legged Frog.

Reptiles

Thamnophis ordinoides (Baird and Girard). Northwestern Garter Snake.

Only one gravid female was sighted. The snake was captured on June 29 by the road on the edge of the reserve about one-tenth of a mile east of the main pond. This animal was eating a slug at the time. The specimen was kept but died in September, 1974, without giving birth (preserved at University of Victoria). Two other individuals were observed further south outside of the reserve. Presumably, this species is fairly common in the reserve.

Thamnophis elegans vagrans (Baird and Girard). Wandering Garter Snake.

Only one specimen was observed and caught (June 30). This snake was probably in its first year as it was quite small (S-V length of 170 mm)*. It was captured on the road's edge near the border between sections 32 and 39. This specimen was also kept, but died (preserved at University of Victoria).

Thamnophis sirtalis pickeringi (Carl). Puget Sound Red-sided Garter Snake.

This was the most common of the snake species observed.

T. sirtalis pickeringi were either observed on the road or near the main stream at the Mountain Road crossing. Of the eight snakes observed, seven

*S-V is Snout-Vent length

were sighted between May 26 and June 25 - probably the most active feeding period of the year. It was a sunny and relatively warm period. The first two snakes obtained in May were gravid females (lengths of 555 mm and 570 mm, S-V). Two other catchable snakes were males measuring 435 mm and 460 mm, S-V.

Amphibians

Ambystoma g. gracile (Baird). Northwestern Salamander.

Several larvae were found in the pond of the reserve during the month of June. None were obtained after June. They seemed to be considerably less abundant than tadpoles of Rana a. aurora and Hyla regilla.

Only two adults were found on this reserve during the study period. The first one was found May 9, with a length of approximately 150 mm (S-V), 70 meters from the ocean next to the major creek. The second adult was found near the same stream, but where Mountain Road crosses, on July 12, 1974 in one of the salamander traps. Its length (S-V) was approximately 120 mm.

Hyla regilla (Baird and Girard). Pacific Treefrog.

This species was abundant during May at the pond. Its presence was evidenced by the vocal chorus of loud croaking by the males. No adults were sighted near the pond during June, but in July several adults were observed in moist areas near the pond. They were most abundant north of the pond near the boundary of the reserve in a marsh area.

Tadpoles were found in abundance in the pond during May, June and July. Recently transformed animals were found in the immediate area on moist ground or in the pond itself.

Rana a. aurora (Baird and Girard). Northern Red-legged Frog.

This species was abundant near fresh water on the reserve. The densest concentration of them was found at the pond in the northeastern region of the reserve. During May, adults were found at the pond; none were observed in other areas of the reserve. During early June adults were found in the creek as well as the pond. Thirteen individuals from the water where the road first crosses the creek (northwest corner of section 39) were marked. The average length of these adults was 51 mm (with sd-13.42 mm) with a range of 36-73 mm. Recaptures (six of the original 13) indicated that individuals generally stayed in the same locality until the part of the creek where they were dried up; then they would move up or down the creek to a new pool. The creek ceased flowing in mid July.

Tadpoles were found in the pond from late May through August. Recently transformed animals were found in the pond and in puddles near the pond during July and August.

Ecological Reserve No. 37, Mount Maxwell, Saltspring Island

Mount Maxwell Reserve is located west of Mount Maxwell Provincial Park and encompasses that land contained in the northeastern quarter of section 81. The reserve contains 160 acres, part of which consists of an undisturbed strand of Garry Oak.

The road to Mount Maxwell Park just touches the far northeastern corner of the reserve. This corner is the highest point of the reserve. The reserve is on a steep southwesterly slope. The terrestrial environment varies between Garry Oak forest with grass ground covering, Douglas-Fir forest with Salal, and rock outcropping (with grass and moss). Because of the southwestern exposure the grass and much of the moss dries out early in the summer and little moisture is available within the reserve for vertebrates. The only creek is a small one that just touches the eastern boundary; in 1974, this creek dried up in early July. The nearest pond is one-tenth of a mile east of the northeastern boundary of the reserve. The stream is an overflow for this pond.

The habitat seems suitable for most local reptiles, but not for amphibians that require constant moisture.

Check-List of Vertebrates

Mammals - (Cowan & Guiguet, 1965)

- Tamiasciurus hudsonicus lanuginosus (Bachman). Red Squirrel.
Peromyscus maniculatus angustus (Hall). White-footed Mouse.
Microtus townsendi tetramerus (Rhoads). Townsend Vole.
Mustela vison evagor (Hall). Mink.
Odocoileus hemionus columbianus (Richardson). Coast or Columbian
 Blacktail Deer. *goat?*

Birds - (Petersen, 1961; E. Eisenmann, 1973)

- Cathartes aura. Turkey Vulture.
Haliaeetus leucocephalus. Bald Eagle.
Pandion haliaetus. Osprey.
Bonasa umbellus. Ruffed Grouse.
Selasphorus rufus. Rufous Hummingbird.
Cyanocitta stelleri. Steller's Jay.
Corvus corax. Common Raven.
Corvus caurinus. Northwestern Crow.
Parus rufescens. Chestnut-backed Chickadee.
Thryomanes bewickii. Bewick's Wren.
Turdus migratorius. American Robin.
Spinus pinus. Pine Siskin.
Spinus tristis. American Goldfinch.
Junco hyemalis oregonus. Oregon Junco.

Reptiles - (Logier & Toner, 1961; Stebbins, 1966)

Gerrhonotus coeruleus principis (Baird and Girard). Northern
Alligator Lizard.

Thamnophis ordinoides (Baird and Girard). Northwestern Garter Snake.

Thamnophis sirtalis pickeringi (Carl). Puget Sound Red-sided Garter Snake.

Amphibians - (Logier & Toner, 1961)

Ambystoma gracile gracile (Baird). Brown or Northwestern Salamander.

Hyla regilla (Baird and Girard). Pacific Treefrog.

Reptiles

Gerrhonotus coeruleus principis (Baird and Girard). Northern Alligator Lizard.

Only one individual was actually seen (during June). This specimen was sighted among the rocks in an exposed area one-fourth of the way down the transect (northeast to southwest corner) from the northeastern corner. With the many rock outcroppings exposed on this hillside there could be a substantial population of lizards on this reserve. Extensive trapping would have to be conducted to determine this.

Thamnophis ordinoides (Baird and Girard). Northwestern Garter Snake.

Three specimens were observed, but not captured. All of their total lengths were approximated to be between 250-320 mm. All three animals were sighted midway down the slope on warm days June 6, July 9 and July 23.

Thamnophis sirtalis pickeringi (Carl). Puget Sound Red-sided Garter Snake.

Three individuals were sighted (June 29, July 4 and 11), but none were captured. All were between 500 and 650 mm in total length. One was at the top of the reserve crossing the road. One was half way down the transect (northeast to southwest corner) and one near the lower southwestern corner. All were sighted on warm days.

Amphibians

Ambystoma g. gracile (Baird). Northwestern Salamander.

One adult was observed in a rotting log near the stream during

early June. No other adults could be found during the summer. I obtained one larva from the pond one-tenth of a mile east of the reserve on July 19.

Hyla regilla (Baird and Girard). Pacific Treefrog.

Only four specimens were sighted or captured in the reserve during June and July. All were in moist mossy habitats. During July many tadpoles were obtainable from the pond east of the reserve. No adults were observed in the pond area during this time.

Rana a. aurora (Baird and Girard). Northern Red-legged Frog.

Although no specimens of this species were obtained or sighted on the reserve, the pond east of the reserve was inhabited by many adults during July and August. It may be that the reserve has no resident population since there is no permanent body of water on the reserve. No tadpoles were obtained from the pond.

Ecological Reserve No. 15, Saturna Island

The Saturna Island Reserve encompasses the northwestern quarter of section 3 and the southeastern quarter of section 9 of the island. The reserve has an area of 324 acres. Almost all of the reserve is a Douglas Fir forest with Salal undergrowth.

Only one stream was found on the reserve. The stream starts inside the northern boundary of section 3 and runs in a northerly direction into Lyall Creek (the main body of water on the island). This stream dried up early in the summer. There are a few marsh areas in both sections that are wet during rainy periods. The nearest pond was about one mile south from Navarez Road on the road to Mount Warburton Pike, one half mile from the western boundary of the reserve (section 9 portion).

There are two roadways leading to the reserve. The road to Mount Warburton Pike traverses section 9 in a southeastern direction and then runs south outside the western boundary of that portion of the reserve in section 3. This portion can also be reached from an easterly direction by a rough road (passable only by a four-wheel-drive vehicle in the dry season) coming from the Navarez Road a mile west of Navarez Bay.

Check-List of Vertebrates

Mammals - (Cowan & Guiguet, 1965)

Tamiasciurus hedsonicus lanuginosus (Bachman). Red Squirrel.

Peromyscus maniculatus angustus (Hall). White-footed Mouse.

Odocoileus hemionus columbianus (Richardson). Coast of Columbian
Blacktail Deer.

Birds - (Petersen, 1961; E. Eisenmann, 1973)

Cathartes aura. Turkey Vulture.

Bonasa umbellus. Ruffed Grouse.

Chordeiles minor. Common Nighthawk.

Selasphorus rufus. Rufous Hummingbird.

Colaptes cafer. Red-shafted Flicker.

Parus rufescens. Chestnut-backed Chickadee.

Certhis familiaris. Brown Creeper.

Thryomanes bewickii. Bewick's Wren.

Turdus migratorius. American Robin.

Trochæus naevius. Varied Thrush.

Spinus tristis. American Goldfinch.

Pipito erythrophthalmus. Rufous-sided Towhee.

Junco hyemalis oregonus. Oregon Junco.

Amphibians and Reptiles

No amphibians or reptiles were observed on Saturna Island Reserve during this survey. In early August, two Thamnophis sirtalis pickeringi were sighted near the edge of the pond that is one-half mile west of the reserve. During July and August, tadpoles of Hyla regilla were present in this same pond. Recently transformed animals were observed during August. Besides the above mentioned herps, Gerrhonotus coeruleus principis is the only other herptile species previously recorded for Saturna Island (UBC specimen #986, 1960).

Suggestions for Further Study

All of the other work on B.C. ecological reserves, with the exception of this vertebrate inventory and the insect inventory of the Mount Maxwell Reserve by James McBean, have been vegetative studies. More information is needed on the animals present on these reserves. I will suggest some general methods that may be used in conducting further vertebrate surveys.

Depending upon the situation, there are at least two possible ways of approaching a survey study. If a person cannot be present for an adequate period of time to do an in-depth survey, several individuals, preferably with specialized knowledge of particular vertebrate classes, could spend a few days each season noting what they sighted and trapped.

Usually a more detailed study over a longer period of time is desirable as more valid conclusions may be drawn about the presence and behavior of particular species. Extensive trapping is suggested for all classes. Individuals should be marked, measured, sexed and any particular characteristics noted before being released at points of capture. The area should be mapped with regard to geological and vegetative characteristics. A map could be useful in determining habitat preferences and location of individual captures. Thus, the movements of individuals, their interrelationships, activity patterns, growth rate and other facts could be ascertained. Persisted definition of factors influencing distributions could be obtained through the use of a multivariate analysis (see Green, 1973).

Trapping should be done with appropriate sizes of live traps. A rough survey may prove useful in ascertaining the relative concentrations

of individuals and species, and as an aid to more efficient trapping. Fresh water sources are generally places of high concentrations for many vertebrate species. Spring and autumn months are when migratory and mating behavior peaks for all of the vertebrate classes, thus these are usually the more favorable time periods for trapping.

Dr. P. Gregory (University of Victoria) suggests that more surveys be done by graduate students if appropriate arrangements could be made. It is also suggested that adequate animal surveys be done in areas of proposed ecological reserves to establish animal habitats and ranges so these factors may have a greater influence on establishing boundaries of the reserves. Such a procedure would enable zoologists to more accurately survey and study these reserves in the future.

Appendix

Reptile and Amphibian species recorded for Vancouver Island and immediately surrounding islands. (British Columbia Provincial Museum records).

Reptiles -

Gerrhanatus coeruleus principis (Baird and Girard). Northern Alligator Lizard.

*Eumeces skiltonianus (Baird and Girard). Western Skink.

Pituophis catenifer deserticola (Stejneger). Great Basin Gopher Snake.

Thamnophis ordinoides (Baird and Girard). Northwestern Garter Snake.

Thamnophis elegans vagrans (Baird and Girard). Wandering Garter Snake.

Thamnophis sirtalis pickeringi (Carl). Puget Sound Red-sided Garter Snake.

Contra tenuis (Baird and Girard). Sharp-tailed Snake.

Chrysemys picta belli (Gray). Western Painted Turtle.

Dermochelys coriacea schlegelt (Garman). Pacific Leather-back Turtle.

Amphibians -

Taricha granulosa granulosa (Skilton). Pacific Coast Newt.

Ambystoma macrodactylum (Baird). Long-toed Salamander.

Ambystoma gracile gracile (Baird). Northwestern Salamander.

Plethodon vehiculum (Cooper). Western Red-backed Salamander.

Ensatina eschscholtzi (Gray). Red Salamander.

Aneides ferreus (Cope). Clouded Salamander.

Bufo boreas boreas (Baird and Girard). Northwestern Toad.

Hyla regilla (Baird and Girard). Pacific Treefrog.

Rana aurora aurora (Baird and Girard). Red-legged Frog.

*McNicholl (unpublished)

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