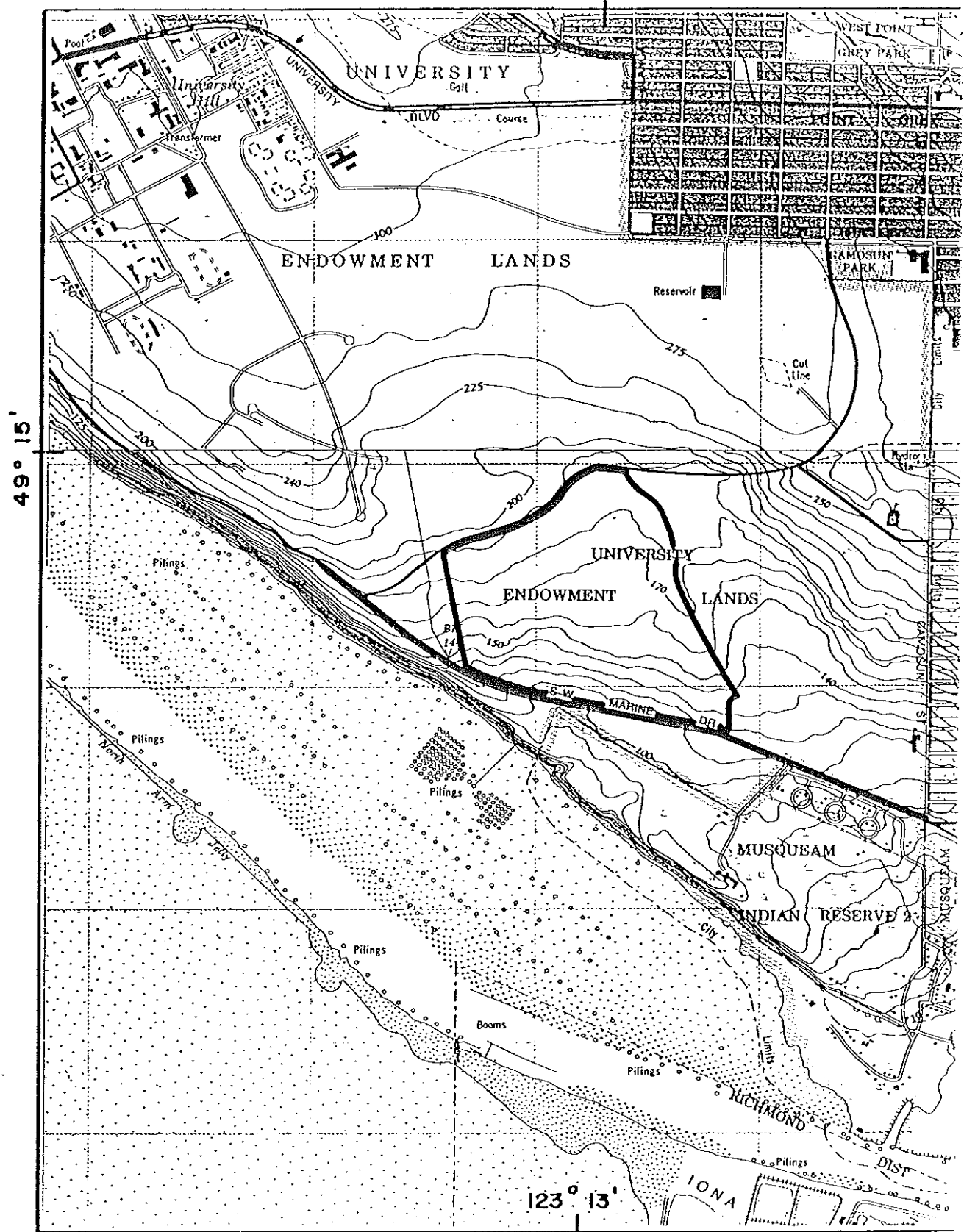


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ECOLOGICAL RESERVE No. 74
U.B.C. ENDOWMENT LANDS

N.T.S. No. 92 G/
92 G/

The following major ecosystems may be easily recognized in the proposed ecological reserve area:

Symbol on the Map: 2. Douglas-fir (*Pseudotsuga menziesii*) - grand fir (*Abies grandis*) - western redcedar (*Thuja plicata*) - swordfern (*Polystichum munitum*) plant association. Douglas-fir grows here in height of 160-180 feet tall trees in 100 years. From the plants, living here, the following should be mentioned: *Alnus rubra*, *Acer macrophyllum*, *A. circinatum*, *Cornus nuttallii*, *Rhamnus purshiana*, *Taxus brevifolia*, *Sambucus pubens*, *Rubus spectabilis*, *R. parviflorus*, *Ribes lacustre*, *Polystichum munitum*, *Tiarella trifoliata*, *Athyrium filix-femina*, *Adenocaulon bicolor*, *Galium triflorum*, *Montia sibirica*, *Trillium ovatum*, *Geum macrophyllum*, *Streptopus amplexifolius*, *Dryopteris austriaca*, *Polypodium glycyrrhiza*, *Carex leptopoda*, *C. hendersonii*, *Osmorhiza chilensis*, *Tellima grandiflora*, *Dicentra formosa*, *Stellaria crispa*, *Blechnum spicant*, *Disporum oreganum*, *Bromus vulgaris*, *Circa latifolia* and *Festuca subulata*. From bryophytes at least the following should be mentioned: *Plagiomnium insigne*, *P. venustum* (on the bark of broadleaf maple), *Leucolepis menziesii*, *Rhizomnium glabrescens*, *Brachythecium aspernum*, *Epipterygium tozeri* (otherwise very rare), *Isothecium stoloniferum*, *Claopodium crispifolium*, *Neckera menziesii*, *N. douglasii*, *Dendroalsia abietina*, *Antitrichia curtipendula*, *Eurhynchium praelongum*, *Homalothecium fulgescens*, *H. nuttallii*, *Tetraphis pellucida*, *Lepidozium reptans*, *Calypogeia fissa*, *C. suecica*, *C. trichomanis*, *Scapania bolanderi*, *S. umbrosa*, *Lophocolea bidentata*, *L. cuspidata*, *L. heterophylla*, *Plagiochila asplenioides*, *Cephalozia leucantha*, *C. lammersiana*, *C. media*, *Cephaloziella divaricata*, *Radula complanata*, *Porella cordaeana*, *P. navicularis*, *P. platyphylla*, *Frullania nisquallensis*, *Pellia neesiana*, *Conocephalum conicum* and *Marchantia polymorpha*. Soil is mainly Gleyed Dystric Brunisol. In some areas the lateral seepage water, keeping this environment highly productive, was diverted by drainage along the Marine Drive.

Some basic ecological studies were made here in these highly productive forest sites of the Endowment Lands (see R. Garm, 1958: Some aspects of the nitrogen cycle in soil of the Douglas-fir forest).

Two variants are distinguished on the map of this area: 2a (with more permanent seepage) and 2b (with rather temporary seepage). In 2a Douglas-fir may reach its highest site index: 180' (55m)/100 years.

Symbol on the Map: 3. Red alder (*Alnus rubra*) - Douglas-fir (*Pseudotsuga menziesii*) - western redcedar (*Thuja plicata*) - western hemlock (*Tsuga heterophylla*) - Oregon grape (*Mahonia nervosa*) - thimble-berry (*Rubus parviflorus*) - moss (*Eurhynchium oreganum*) plant association, developed on the plateau which was submerged under the sea during

the last glaciation. Soil is still close to Regosols of marine deposits developing towards Dystric Brunisols. If it is rather Regosol, the occurrence of *Rubus spectabilis* and even *Sambucus pubens* is frequent. These plants become less frequent in Dystric Brunisols, where *Vaccinium parvifolium* is becoming frequent, *Polystichum munitum* is only sparse. *Mahonia nervosa* is frequent and sometimes dominant. Red alder (*Alnus rubra*) and bitter cherry (*Prunus emarginata*) are frequent and in some areas, where Douglas-fir did not start to grow early enough, these angiospermous trees became dominant, *Alnus rubra* (with some *Cornus nuttallii*) being promoted especially in consequence of nutritionally rich marine deposits. Western hemlock (*Tsuga heterophylla*) got established here on decaying wood. There are some plants which grow better in the swordfern plant associations (see plant community no. 2), but most of them grow in much lower vigour and species significance here. Besides *Mahonia nervosa*, which is missing in the typical swordfern plant communities and on the contrary very common here, *Trientalis latifolia* is frequently growing here.

Theoretically, this soil would mature into a Thin Podzol and, then, the plant association would be successional replaced by the salal (*Gaultheria shallon*) plant community. Interestingly enough, salal is missing here either completely or occurring only on decaying wood. These successional consequences with several variants could be easily demonstrated in the Endowment Lands.

Two variants are distinguished on the map of this area: 3a (which is the main core of this plant association, representing its ecological "nodum") and 3b (degraded type of this plant association).

Symbol on the Map: 5. Red alder (*Alnus rubra*) - Sitka spruce (*Picea sitchensis*) - western redcedar (*Thuja plicata*) - skunk-cabbage (*Lysichitum americanum*) plant association is represented only by fragments, even if it used to be fairly frequent in the Endowment Lands. It occurs on Gleysols with thick black muck, developed in seepage habitats where moving water comes to the surface and permanently saturates even the humus layer. It is a common habitat for Sitka spruce which grows here usually with Oregon crab apple (*Pyrus fusca*). In the shrub layer *Rubus spectabilis*, *Acer circinatum* and *Rhamnus purshiana* are frequent. *Vaccinium ovalifolium* and occasionally *V. alaskaense* are here as relicts from glaciation. In the herb layer *Lysichitum americanum* is the most significant and common herb (substantially damaged by the artificial drainage) associated with *Maianthemum dilatatum*, *Veratrum viride*, *Oenanthe sarmentosa*, *Montia sibirica*, *Mimulus moschatus*, *Cardamine breweri* and *Veronica americana*. In the moss layer these bryophytes are frequent: *Eurhynchium praelongum*, *Rhizomnium perssonii*, *Plagiomnium insigne*, *Leucolepis menziesii*, *Brachythecium asperrium*, *B. lamprochryseum*, *Caliergonella cuspidata*, *Climacium dendroides*, *Rhytidiadelphus squarrosus* (this one mostly in the disturbed areas),

Marchantia polymorpha, *Conocephalum conicum*, *Blasia pusilla*, *Pellia columbiana*, *Riccardia sinuata*, *Chiloscyphus pallescens* and *Anthoceros punctatus*. On the leached layer of overturned trees in this area is *Schistostega pennata* (very rare otherwise). To restore some of these habitats the excessive artificial drainage should be stopped. Otherwise Sitka spruce and western redcedar will die out in these habitats.

Two variants may be easily recognized for this plant association: 5a has a strong seepage water supply, saturating permanently the top of the black muck horizon; 5b has less strong seepage water supply, permitting that the black muck layer partly "drying out" during the summer and, therefore, developing more "terrestrial" habitat over which it is possible to walk. In the first variation skunk cabbage (*Lysichitum americanum*) is vigorous and dominant; this plant grows weakly in the second variation, where *Maianthemum* vastly dominates.

The area of the Endowment Lands belongs to the coastal Douglas-fir biogeoclimatic zone (climate is Cbs or barely Cbf according to Köppen, annual precipitation about 50"). Most of this area was submerged under the sea during the last glaciation. Therefore, the soils, originally as marine deposits, are overlain by glacial till only in the highest parts of this area and many ecosystems are still bearing this evidence. Such plant communities are most interesting for teaching of the ecological interpretation, even if they are more complex than they should be for those who are learning the first steps in ecology.

Since 1949, when I became a member of the Department of Biology and Botany, U.B.C., I have used the areas of Endowment Lands for many field trips which I organized for my students of either plant ecology or dendrology (totally about 500 students) and also for about 35 graduate students. Without these areas I could not teach my students so efficiently as I possibly did according to the personal letters of my graduate students, which I received in 1971. The Endowment Lands, which already lost some of precious "wilderness" areas by some more recent development, and the lands between Marine Drive and the coast or the banks of the Fraser River are the closest natural areas near the University of British Columbia which can be demonstrated to the university students without any greater loss of time otherwise required for the access of similar areas. To teach especially Plant Ecology (both vegetation and its environment) without availability of such areas would be very difficult if not even impossible.

Great Blue Herons (*Ardea herodias*) nest on the Endowment Lands (see no. 9 on the attached map). It has been estimated that about 50% (about 125 nesting pairs) of these beautiful birds nest on the Endowment Lands close to the Fraser River. "If

these birds were driven off they would perish since other nesting sites and food sources in the surrounding area could not stand the increased load" (Norris, 1971). This number was substantially lowered in the last year (J. Krebs, pers.comm.).

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