GENTIANACEAE - GENTIAN FAMILY

Gentiana douglasiana Bong. (Douglas' gentian)

Common in most pine bog forests and sphagnum bogs, rooted directly in the sphagnum. Especially abundant in Cullite Bog, and in the pine bog forest on the trail to the Cape Beale Lighthouse. (Pc, SpLg).

Gentiana sceptrum Griseb. in Hook. (Swamp gentian)

Rare; found only growing on a flooded point bar on the Tsusiat River, and in the Myrica community on the northwest shore of Kichha Lake. Appears to flower very late in the summer, and so remains inconspicuous most of the year. (PsTh, Np).

MENYANTHACEAE - BUCK BEAN FAMILY

Menyanthes trifoliata L. (Buckbean)

Very sparse; grows in dense stands in Kichha Lake, just beyond the Scirpus zone, and occasionally in the open water areas of sphagnum bogs, with Nuphar polysepalum. (Np, SpLg).

Nephrophyllidium crista-galli (Menzies) Gilg. (Deer cabbage)

Sparse; common in restricted areas of some sphagnum bogs and pine bog forests, especially where a layer of water has accumulated on the surface of the sphagnum. Usually near the margins of the bogs, or close to pine trees, where some shelter is provided. Forms dense, pure clumps. (Pc, SpLg).

CONVOLVULACEAE - MORNING-GLORY FAMILY

Convolvulus soldanella L. (Beach morning-glory)

Very scattered; growing on exposed sandy areas of dry sand beaches, sand dunes, and sand blowouts. On Topaltas Beach, Keeha Beach, and the Clo-oose sand dunes. This species does not preserve well, the flowers retaining little of their clear pink color. (Em).

LABIATAE (LAMIACEAE) - MINT FAMILY

*' Glecoma hederacea L. (Ground ivy)

Rare; found only on a shell midden at Whyak, where it was probably planted originally, but has spread to cover large portions of the midden. A native of Eurasia, frequently used in America for ground cover and well-established now as a weed. Flowering April-June. (SM).

Mentha arvensis L. (Wild mint)

Found only on the shell middens at Whyak, where it is fairly widespread in sheltered areas. (SM).

Prunella vulgaris L. (Self-heal)

Fairly common in the herb community of rocky headlands, where it grows in the more sheltered areas in crevices in the rock; and in disturbed areas, such as the Pachena Bay campground, and portions of the Trail, where it approaches lighthouses or abandoned buildings. Usually in moist, well-drained soil. (FrPm, GsLi, D).

LABIATAE, Cont'd.

* Stachys coolyae Heller (Hedge nettle)

Sparse; occurs sporadically in the driftwood zone, usually where subsurface moisture is present, and around the margins of shell middens. This species is very similar to S. mexicana Benth., being differentiated on the basis of its longer corolla tube. Since the ranges of both species overlap along the coast, it is important to examine every specimen carefully to insure accurate identification. It was found that in late summer, when the flowers are mature, the two species are relatively easy to separate; but there can be considerable difficulty in the spring and early summer, before the corolla tube has elongated to its full length. (Em, SM).

Stachys mexicana Benth. (Mexican hedge nettle)

Sparse; occurs in the same habitat types as S. coolyae, but is somewhat more common. (Em, SM).

SCROPHULARIACEAE - FIGWORT FAMILY

Castilleja miniata Dougl. ex Hook. (Indian paintbrush)

Scattered; grows in pockets of soil on rocky headlands and stacks, in the shrub transition zone of many sandy beaches, in the stabilized shrub zones of rocky headlands, and on most shell middens. Common on the dry sea cliffs in many areas where the Trail follows the beach. (Em, ArGs, FrPm, GsLi, SM).

SCROPHULARIACEAE, Cont'd.

' Digitalis purpurea L. (Foxglove)

Rare; occurs along the trailside where it passes through Clo-oose, and on the shell middens at Whyak. In moist but well-drained, disturbed soils. (D, SM).

Mimulus guttatus DC. (Yellow monkey flower)

Very sparse; found on moist seepage cliffs and rock shelves on the immediate coast, and rarely on the sheltered, inland side of rock stacks. Common around Tsusiat Falls, and fairly regularly seen on the sea cliffs between Walbran Creek and Camper Bay; also present on the rock shelf near Owen Point. (FrPm).

Scrophularia californica Cham. & Schlecht. (Coast figwort)

Sparse; found in the shrub transition zones, immediately behind the driftwood, on moist, sheltered beaches, and on the shell middens at Whyak, along the side of the Trail, where it is common. (ArGs, SM).

Veronica americana Schwein. ex Benth. (American brooklime)

Rare; found in the shrub transition zone at the head of Pachena Bay, in moist, organically enriched soil, and on the banks of the Tsusiat River, where it grew semi-aquatically. (ArGs, PsTh).

*' Veronica arvensis L. (Corn speedwell)

Extremely rare; found only in the Pachena Bay campground, in an old campsite clearing on dry, sandy soil. A European weed now established throughout most of North America. Flowering April-September. (D).

SCROPHULARIACEAE, Cont'd.

* Veronica scutellata L. (Marsh speedwell)

Extremely rare; discovered only on a flooded, grassy point bar on the Tsusiat River. A decumbent species, rooting at the nodes, and often growing semi-aquatically. In rich, moist alluvial soil. Flowering May-September. (PsTh).

OROBANCHACEAE - BROOMRAPE FAMILY

Boschniakia hookeri Walpers (Vancouver ground cone)

Rather rare; a parasite on salal, found growing in the pine bog forest on the south shore of Kichha Lake, and in the spruce-salal forest behind Second Beach, on Cape Beale. It appears to flower early in the spring, as all specimens observed during June and July had already set seed. The somewhat larger B. strobilacea A. Gray was not discovered. (Pc, PsGsPa).

LENTIBULARIACEAE - BLADDERWORT FAMILY

* Utricularia vulgaris L. (Common bladderwort)

Rare; found floating in the warm, shallow water of Kichha Lake with Potamogeton spp. U. minor, found in the Broken Group Islands by Bell and Harcombe (1973), may also be present, but was not collected. This plant was never observed in bloom, at which time it is quite conspicuous due to the bright yellow, spurred flowers, which are aerially produced. (Np).

Pinguicula vulgaris L. (Butterwort)

Rare; found on very moist sphagnum in the bog three-quarters of a mile north of the Klanawa River, and in soil pockets on seepage cliffs

LENTIBULARIACEAE, Cont'd.

on the banks of the Klanawa River and Walbran Creek. Those plants growing on rock cliffs frequently do not produce flowers, but are easily recognizable by the basal rosette of slimy, glandular leaves. An insectivorous plant, like Utricularia. (SpLg, PsTh).

PLANTAGINACEAE - PLANTAIN FAMILY

Plantago lanceolata L. (English plantain)

Sparse; found in disturbed sites, such as the Pachena Bay campground, and along old logging roads on Cape Beale, and at the mouth of the Gordon River on a raised estuarine terrace. At this last location, the plant exhibited a dwarf stature, with a globose inflorescence, apparently in response to the saline conditions. (D, DcSv).

Plantago macrocarpa Cham. & Schlecht. (Plantain)

Very sparse; found in the inland sphagnum bog three-quarters of a mile north of the Klanawa River, and at one location on the margin of Kichha Lake. It is possible that this species is also present in some estuarine and salt marsh conditions, but was confused with P. maritima. All the specimens observed and identified, however, were much larger and less succulent than this latter species. (SpLg, Np).

Plantago major L. (Common plantain)

Rare; found along the roadside in the Pachena Bay campground, on moist, disturbed soil. (D).

PLANTAGINACEAE, Cont'd.

Plantago maritima L. (Marine plantain)

Common on the rocky headlands, where it grows in crevices in the rocks under very exposed conditions; occasional on sandy beaches under salt marsh conditions; and fairly common in the lower estuarine regions. The species seems to exhibit an ecoclinal gradient in stature, becoming shorter and more succulent, as growing conditions become more exposed and saline. (FrPm, Em, DcSv).

RUBIACEAE - MADDER FAMILY

Galium aparine L. (Cleavers)

Very scattered; found in the upper beach zone, at the base of the shrub fringe, on moist, sheltered beaches (northwest shore of Pachena Bay), and rarely on shingle beach tongues between cliffs (Keeha Beach). Has a scrambling growth form, and is extremely scabrous, sticking firmly to the hands and clothing when collected. (Em, FrPm).

Galium triflorum Michx. (Bedstraw)

Very scattered; found on moist sites in disturbed areas (the shrub fringe at Pachena Bay), along the trailside under hemlock and fir forests, along streambanks, and very rarely in the upper beach zone over seepage sites. G. trifidum L. may also be present, but was not encountered. (D, PsTh, Em).

CAPRIFOLIACEAE - HONEYSUCKE FAMILY

Linnaea borealis L. (Twinflower)

This attractive, mat-forming plant is common in most forest areas as a ground level herb. It is abundant in muskeg, pine bog and cedar-hemlock forests, in sphagnum bogs on the drier hummocks, in spruce-salal forests on rock outcrops, and in logged areas, where it grows on decaying stumps. Habitat ranges from dry to moist, on a variety of soil types. (TpTh, Tp, Pc, SpIg, PsGsMd, L).

Lonicera involucrata (Rich.) Banks ex Spreng. (Black twinberry)

An abundant shrub in the windbeaten thickets on the outer coast. Also common in the spruce-salal forest behind this fringe; in spruce-salmonberry forest types; along open streambanks near the ocean; on shell middens, and in the shrub transition zone behind estuaries. One of the few shrubs producing inedible berries. (ArGs, PsGsPa, GsLi, PsGsMd, PsRsPm, PsTh, SM, DcSv).

Sambucus racemosa L. (Red elderberry)

Scattered; found commonly in spruce-salmonberry-swordfern forests on marine terraces, rarely in the shrub fringe on moist beaches, and occasionally in logged areas. This tree is very common along the Trail at Clo-oose, filling an entire ravine under the boardwalk which leads from the beach to the northern end of the old townsite. It may have been planted as an ornamental species at one time, but has spread rapidly and extensively to cover much of the area. (PsRsPm, ArGs, L, D).

CAPRIFOLIACEAE, Cont'd.

Symphoricarpos albus (L.) Blake (Snowberry)

Rather rare; found in the shrub fringe and spruce-salal forest at Second Beach, on the north side of Cape Beale, and in the logged area near Brown's Cove, on the Nitinat Narrows. Also present in the Pachena Bay campground. On moist, sheltered sites with well-drained soil. (ArGs, PsGsPa, L).

Viburnum edule (Michx.) Raf. (Squashberry)

Rare; found only along the banks of the Tsusiat River, with Lonicera and Alnus, growing about one-quarter mile inland from the coast. (PsTh).

VALERIANACEAE - VALERIAN FAMILY

Valeriana sitchensis Bong. (Mountain valerian)

Very rare; found on the banks of the Klanawa River, growing on shaded, mossy rocks with Viola glabella and Trautvettaria. This is normally a subalpine species, and not usually found at sea level, as in this case. In its normal habitat, Valeriana has an upright growth form, but all of the Klanawa River plants were decumbent or prostrate. (PsTh).

CAMPANULACEAE - HAREBELL FAMILY

Lobelia dortmanna L. (Water lobelia)

Found only growing on the streambed of the Tsusiat River with other aquatic plants, and very rare at this location. (PsTh).

COMPOSITAE (ASTERACEAE) - SUNFLOWER FAMILY

Achillea millefolium L. (Yarrow)

Common; grows on dry rocky headlands in debris-filled crevices; behind the driftwood zone on sandy beaches; on the seaward side of the shrub fringe on south-facing headlands and beaches; on shell middens; in disturbed areas, and around the margins of salt marshes. (FrPm, GsLi, Em, D, SM, DcSv).

Ambrosia chamissonis (Less.) Greene (Silver beachweed)

Rare; found in the driftwood zones of Pachena Beach and Keeha Beach; on dry, exposed sand. Hitchcock et al (1969), lists this species as Franseria chamissonis Less. (Em).

Anaphalis margaritacea (L.) B. & H. (Pearly everlasting)

Common on dry rocky headlands; behind the driftwood zone on dry beaches with a sandy transition area; on sheltered but dry sea cliffs, and in logged areas. Often does not flower, but is very conspicuous when in bloom and for many weeks afterward, due to the numerous, scarious white bracts of the inflorescence. (FrPm, Em, GsLi, L, D, DcSv).

Apargidium boreale (Bong.) T. & G. (Bog dandelion)

Restricted to pine bog forests and sphagnum bogs, where it is fairly common. May occur occasionally in muskeg forests where sphagnum is abundant. (Pc, SpLg).

*! Arctium minus (Hill) Bernh. (Burdock)

Extremely rare; found only on the most seaward midden at Whyak, growing on the trail between the old buildings. A Eurasian weed, established widely throughout North America in waste places. Flowering July-October. (SM).

COMPOSITAE, Cont'd.

* Arnica amplexicaulis Nutt. (Clasping arnica)

Rare; found on the banks of the Klanawa River, in well-drained gravel, on moist cliffs near the Tsusiat Falls, and along the rock shelf between Walbran Creek and Camper Bay. The specimens collected are somewhat anomalous in that they are more branched and bushy in form than is normal for the species. (PsTh, FrPm).

Artemesia suksdorfii Piper (Mugwort, Beach sagebrush)

Sparse; found on the gravel bank at the mouth of Camper Creek, and occasionally along the dry cliff faces between the Klanawa River and Michigan Creek. All the plants examined had ciliate involucral bracts, a characteristic of the closely-related A. douglasiana Bess., but were definitely A. suksdorfii according to involucre shape and flower number. (PsTh, Em).

Aster subspicatus Nees (Aster)

Fairly common; found in the upper beach area, behind the driftwood zone, on a number of dry beaches; in the beach herb community over seepage sites; at Camper Bay, and on stabilized rocky headlands south of Camper Bay. (Em, FrPm).

! Bellis perennis L. (English daisy)

Very rare; found only in the Pachena Bay campground on an old campsite in dry, sandy soil. (D).

! Chrysanthemum leucanthemum L. (Ox-eye daisy)

Rare; found only in the Pachena Bay campground, in old clearings and along the sides of some of the logging roads. A widespread weed in some of the logged areas just outside the park. (D).

COMPOSITAE, Cont'd.

* Cirsium edule Nutt. (Indian thistle)

Extremely rare; found only on a dry, slumped clay cliff near the Darling River. Hitchcock et al (1969) state that this is a very distinct species, readily separable from C. brevistylum Cronq.; the specimens collected in this study, however, were very difficult. They exhibited the exserted style characteristic of C. edule, but the corolla proportions of tube and neck were more like those of C. brevistylum. As these are the two supposedly constant and distinctive features separating the species, it is possible that a hybrid may have been encountered: the vegetative characteristics were closer to C. edule, and were relied upon for final identification. (ArGs).

' Cirsium vulgare (Savi) Airy-Shaw (Bull thistle)

Also very rare; found on a gravel bar on the north shore of the Gordon River, in a disturbed area that may have once been part of an old logging road. In well-drained, gravelly soil. (D).

*' Crepis capillaris (L.) Wallr. (Smooth hawksbeard)

Very rare; found on a gravel bar on the north shore of the Gordon River, in a disturbed area, with numerous other weed species. A yellow-flowered hawksbeard native to Europe, and introduced from southern British Columbia to California, west of the Cascades. Flowering May-October. (D).

Hieracium albiflorum Hook. (White hawkweed)

Rare; found only in the sand blowout on Keeha Beach, on dry, sandy, well-drained soil. The only white-flowered hawkweed. (Em).

COMPOSITAE, Cont'd.

! Hypochaeris radicata L. (Cat's ear)

A common weed in dry, well-drained areas. Found often on sheltered rocky headlands in the herb zone and at the base of the shrub fringe; on Topaltas and Keeha Beaches, and in many disturbed areas around abandoned buildings. (FrPm, GsLi, Em, D).

! Lactuca muralis (L.) Fresen. (Wild lettuce)

Very sparse; found on the banks of Walbran Creek, on gravel; around the buildings and dock at Brown's Cove, on sandy gravel; and on the shell middens at Whyak. (D, SM, PsTh).

* Petasites frigidus (L.) Fries (Coltsfoot)

Very scattered; seen in moist ravines on the cliffs under spruce-hemlock forest a mile upisland from the Klanawa River, and on the banks of Logan Creek, in moist gravel. This plant is unusual in that it flowers in the early spring (March-June), before the leaves have developed, so that leaves and flowers are not observed at the same time. The large, palm-shaped leaves are readily recognizable without the inflorescence, however. (PsTh).

* Prenanthes alata (Hook.) D. Dietr. (Rattlesnake root)

Rare; found on the banks of the Klanawa River, on moss-covered rocks, and on the gravel landing at Mud Cove, on Cape Beale. In moist, gravelly situations, usually in the shade. Flowering July-September. (PsTh).

COMPOSITAE, Cont'd.

Senecio sylvaticus L. (Groundsel, Butterweed)

Extremely rare; found on the north bank of the Gordon River in a gravelly area which may once have been a logging road. Growing with numerous other weed species, in dry, well-drained soil. (D).

Solidago canadensis L. (Goldenrod)

Rare; found on the dry, slumped clay cliffs near the Darling River, in a seepage site in the beach herb community with Elymus at Squeaking Beach, and on a gravel bar on the north shore of the Gordon River. The specimen at Gordon River was the only one which was observed to have bloomed. On well-drained soils. (Em, D).

Sonchus asper (L.) Hill (Sow thistle)

Very rare; seen only on Keeha Beach in the sandy transition zone behind the driftwood area. Very dry, exposed conditions. (Em).

Tanacetum douglasii DC. (Tansy)

Sparse; found behind and in the driftwood zone on Keeha Beach, on a rocky headland on Whittlestone Point (Cape Beale), and in the disturbed areas around the old graveyard and golf course at Whyak. On dry, sandy soil, except on Whittlestone Point, where it was growing in fairly moist soil accumulated in crevices in the rocks. (Em, FrPm, D).

*' Tanacetum vulgare L. (Tansy)

Extremely rare; a single plant was discovered on a disturbed gravel bar on the north shore of the Gordon River. Growing on well-drained gravelly soil with numerous other weed species. A native of Europe which is now widespread in North America. Flowering July-October. (D).

COMPOSITAE, Cont'd.

Taraxacum officinale Weber (Dandelion)

Very rare; seen only on the Trailside at Clo-oose, growing with Hypochaeris radicata and Poa pratensis, and on the shell middens at Whyak. It seems probable that this species will spread, in view of its prolific seed production and weedy habit. (D, SM).

ORNAMENTALS

Several ornamental plants were found growing as garden escapes, or around abandoned buildings. They are not naturalized species, and will no doubt eventually be eliminated by native plants. The following is a list of these exotics, in many cases identified only to genus because of the difficulties involved in sorting out the numerous horticultural varieties which have been artificially produced by man. Currently inhabited areas were not considered in collecting these specimens.

* Arrhenatherum elatius (L.) Presl Striped oatgrass. (GRAMINEAE) Found beside the boardwalk leading from the old resort townsite at Clo-oose toward Brown's Cove. Escaped from the garden of the game warden.

* Hedera helix L. Ivy. (ARALIACEAE) Found in an old garden at the side of the Trail as it led through Clo-oose.

* Hemerocallis sp. L. Day lily. (LILIACEAE) Found in the same garden site as Hedera, at Clo-oose.

* Hesperis sp. L. Rocket. (CRUCIFERAE) On a shell midden at Whyak, in an old garden plot.

* Hydrangea macrophylla Ser. Hydrangea. (SAXIFRAGACEAE) Beside the boardwalk near the game warden's cabin at Clo-oose, with Arrhenatherum, also escaped from his garden.

Ilex aquifolium L. English holly. (AQUIFOLIACEAE) On a shell midden at Whyak, behind an abandoned building.

* Papaver sp. L. Poppy. (PAPAVERACEAE) In an old garden at the side of the Trail as it led through Clo-oose.

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APPENDIX I

DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT

NATIONAL & HISTORIC PARKS BRANCH

TERMS OF REFERENCE

FOR

Contract WR 15-73
April 10, 1973

A Vegetative Community Mapping and
Vascular Plant Inventory - Phase III
Pacific Rim National Park

Dr. L. D. Cordes of the University of Calgary, Calgary, Alberta, hereinafter referred to as the Consultant agrees to supply all labour, plant, material and equipment, professional and technical advice and assistance necessary to perform the work to provide a Vegetative Community Mapping and Vascular Plant Inventory - Phase III, Pacific Rim National Park, in accordance with the Terms of Reference dated April 10, 1973 and the Consultant's letter dated April 3, 1973, both attached to and forming a part of this contract to meet the requirements of the Department of Indian Affairs and Northern Development, National and Historic Parks Branch.

Purpose

The project covers the provision of information on the vegetative communities and vascular plants of the Westcoast Trail Section (Phase III) of Pacific Rim National Park.

Project Requirements

More specifically but without limiting the generality of the foregoing, the project requirements shall include:

The Contractor shall:

1. Map the vegetative communities of the Westcoast Trail (Phase III) in the format used in "Flora and Vegetation of Pacific Rim National Park, Phase I, Long Beach" 1971 by Dr. M.A.M. Bell and "Flora and Vegetation of Pacific Rim National Park, Phase II, Broken Island Group" 1972 by Dr. M.A.M. Bell and Mr. A. Harcombe. The plant community boundaries shall be plotted on one 10 mil acetate overlay at a scale of 1:25,000. The overlay shall be adequately labelled, titled and indexed. Communities are to be delineated by shading rather than colour. The use of "pres-type" or "letra-set" shading is preferred. In addition, each report text shall contain one coloured vegetative map on paper, similar to that provided in the aforementioned reports on Phases I and II of Pacific Rim National Park. The National and Historic Parks Branch shall provide the contractor with an adequate base map on which overlays can be prepared. The unmarked base map will be returned to this Branch upon completion of the project.

2. Prepare a report text (in six copies), in the format of the aforementioned reports on Phase I and II of Pacific Rim National Park, that will include the following at least:

   a) A vegetative description of each plant community mapped in (1) above. The description should include the soil types and topographic features commonly associated with the community and a calculation of the percentage of the entire area covered by that community.

   b) An annotated checklist of the higher plants (fern, gymnosperms, angiosperms) found in the area. These notations shall include

species abundance, distribution and comments on the site in which the plant is generally found.

c) Colour photographs of the various vegetative communities delineated in (1) and (4) (a) above.

3. Field surveys and vegetative descriptions and preliminary mapping will be carried out with the aid of aerial photographs and extensive ground checks on a representative sample of the Westcoast Trail (Phase III) sections of Pacific Rim National Park.

4. Aerial photographs will be provided by the National and Historic Parks Branch.

5. All materials required for the field, laboratory, report text and mapping requirements of this project (except where otherwise noted) will be provided by the contractor.

6. The National and Historic Parks Branch will provide free delivery (to beach areas), on a weekly basis, of field requirements, i.e. food, gas, etc.. Materials delivered under this arrangement will have been previously purchased and identified in Victoria by the contractor.

7. All colour photo negatives, original maps, and the manuscript copy of the final report will be provided to this Branch upon completion of the project.

INDEX TO SCIENTIFIC NAMES

Page numbers refer to the listings in the annotated flora. Names of families or higher groups are capitalized.

INDEX TO COMMON NAMES