

Vegetation of Isla de Los Estados, Argentina

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The primary mission of R/V *Hero* cruise 71-5 was a botanical expedition to Isla de los Estados, Argentina, which is off the eastern tip of Tierra del Fuego and is separated from it by LeMaire Strait. This rugged, mountainous island is about 60

kilometers long, with its long axis running east-west. Both the north and south coasts are much dissected by numerous bays and harbors, many fjord-like.

The itinerary of cruise 71-5 was designed to

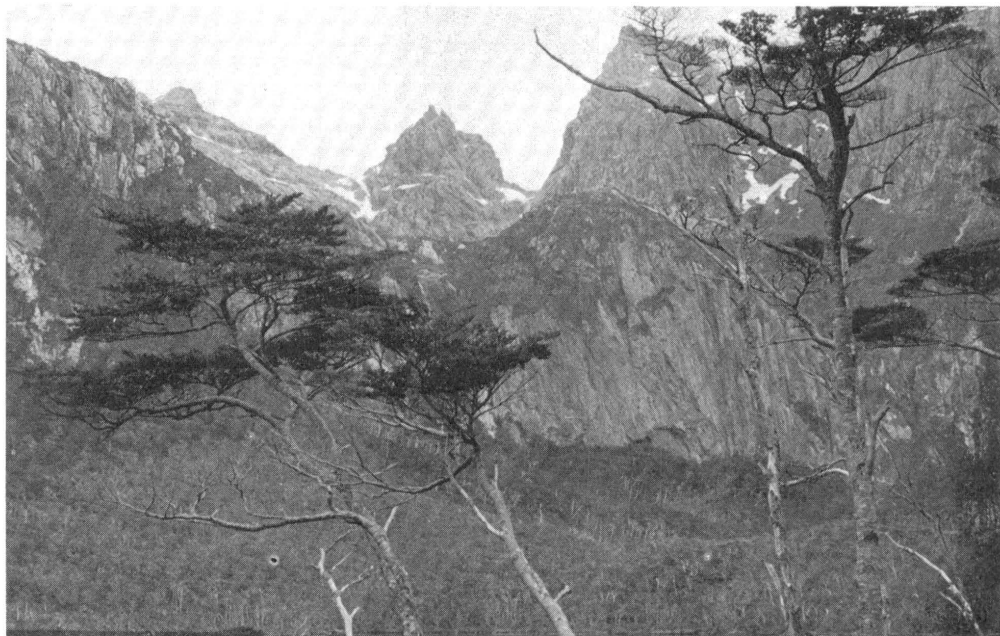


Figure 1. *Nothofagus betuloides*-*Drimys winteri* association. *N. betuloides* is in the foreground. Location: Puerto Celular.

Photos by author



Figure 2. Luxuriant growth of filmy ferns on forest floor. Location: Puerto Parry.

explore both the north and south coasts in an effort to survey the island's flora, including vascular plants, lichens, and bryophytes. Theodore R. Dudley, R. N. P. Goodall, and I dealt with the vascular plants. A full report of *Hero* cruise 71-5 was presented in Imshaug (1972).

The total vascular flora is strikingly impoverished with regard to the number of species comprising



Figure 3. *Nothofagus antarctica* association. Location: Puerto San Juan del Salvamento.

it. About 140 taxa are now known from Isla de los Estados and its adjacent islands. On this expedition 1,413 collections of vascular plants (about 4,000 specimens, including duplicates) were made. Seasonal ephemerals of late spring, summer, and fall were probably not represented in our collections. Eight families of vascular cryptogams and 46 families of angiosperms are represented in the flora. No gymnosperms are known to occur on the island.

The following vegetation types occur on Isla de los Estados:

(1) **Evergreen forest formation.** *Nothofagus betuloides*-*Drimys winteri* association. The evergreen forest of Isla de los Estados is dominated by *Nothofagus betuloides* and by *Drimys winteri* (figure 1). On the northwestern portion of the island, particularly to the west of the Spegazzini Mountains, the evergreen forest is characteristic of the Magellanic evergreen (mesic) transitional forest as described by Young (1973). Considerable litter occurs on the forest floor and there is a marked sparseness of bryophytes and filmy ferns. In contrast, the forest to the south and east of the island is much wetter and the forest floor consists of a luxuriant growth of bryophytes and filmy ferns, particularly *Hymenophyllum tortuosum* (figure 2). The creeping shrub *Prionotes myrsinites* becomes well developed, often forming a dense growth on the forest floor, and frequently occurs climbing up the bases of trunks and rotting stumps. Epiphytic ferns and bryophytes are also frequent and the ground-dwelling fern, *Blechnum magellanicum*, is often encountered. The forest of this portion of the island is more characteristic of the true Magellanic evergreen rain forest occurring along coastal southwestern Chile (Young, 1973).

The forest of Isla de los Estados, especially at Cabo San Juan de Salvamento, at the eastern tip of the island, was an important source of wood for early sealing expeditions as this was the last opportunity to take on wood before heading south to the "barren" islands of the southern oceans (Mitterling, 1959).

(2) **Scrub formation.** (a) *Nothofagus antarctica* association. The summer green (deciduous forest of the Magellanic region is represented by the upper-elevation *Nothofagus antarctica* zone (Skottsberg, 1910). It is restricted to a narrow belt of dwarfed, gnarled, scrub vegetation occurring above the evergreen forest at the upper elevations of the mountains, and just below the alpine zone (figure 3). *Nothofagus antarctica* forms nearly a pure stand of scrub with little undergrowth present. This stunted, thick, crooked, flat-topped vegetation reaches a

height of 1 to 1.5 meters and is nearly impenetrable. Frequently, it was found more profitable to struggle over the flat-topped surface than through it. *Nothofagus pumilio* is entirely absent from the island.

(b) *Nothofagus betuloides*-*Marsippospermum grandiflorum* association. This vegetation type is best developed on the slopes of the rounded hills at Bahía Crossley at the northwestern end of the island. *Nothofagus betuloides* is the important woody constituent, shrubby in habit, and forming a dense growth that is sometimes almost impenetrable. The rush, *Marsippospermum grandiflorum*, is the dominant ground cover (figure 4).

(3) **Magellanic moorland formation.** The plant communities of the moorland are perhaps the most difficult to define since the formation consists of a mosaic of subunits that may be quite small or may be very extensive, as is sometimes the case of *Astelia* mats. The moorland is largely dominated by *Empetrum rubrum*, *Pernettya mucronata*, and *Marsippospermum grandiflorum* (figure 5). *Sphagnum* moss is often present as well. At higher elevations, extensive low, flat mats of *Astelia pumila* and large, flat patches of *Caltha dioneifolia* are frequently encountered. Nowhere on the island were true sphagnum bogs encountered.

(4) **Alpine formation.** Generally alpine sites occur above 450 meters, with the lower limits modified locally by exposure and edaphic factors. Most alpine sites consist of fellfield. The vegetation typically consists of cushion plants creeping along the ground. *Nothofagus antarctica* and *Empetrum rubrum* are generally present, but are greatly dwarfed and grow prostrate to the soil surface (figure 6).

(5) **Meadow formation.** *Marsippospermum grandiflorum* association. This community is generally associated with valleys and other sites of level terrain. The dense growth of *Marsippospermum grandiflorum* gives the appearance of a grass meadow. Woody species attain only a small shrubby form and occur scattered throughout (figure 7).

(6) **Littoral vegetation.** Plants along the rocky shoreline occur rooted in cracks and shallow soil pockets and are mostly cushion plants or tufted plants. *Colobanthes subulatus*, *Crassula moschata*, *Plantago barbata*, and *Poa darwiniana* commonly occur in this habitat.

Sandy beaches are infrequent on this island but where they do occur the most common plants just above the high tide mark are *Senecio candicans*, *Apium australe*, *Caltha sagittata*, *Acaena magellanica*,



Figure 4. *Nothofagus grandiflora*-*Marsippospermum grandiflorum* association. Location: Bahía Crossley.

and bunch grasses. Only two beaches, at Puerto Roca and at Bahía Colnett, are of sufficient length to land a small plane.

(7) **Maritime tussock formation.** (a) *Poa flabellata* association. Out on the headlands and high bluffs facing the ocean there is generally a zone dominated by the tussock grass, *Poa flabellata*. The greatest development of the tussock grass formation was seen on Isla Alfredo Goffré, an island off the north coast (figures 8 and 9). Here the Magellanic penguin finds the tussock grass bases ideal for its burrows.

A site of especial interest is Cabo San Bartolomé, at the southwestern end of the island. Here *Nothofagus betuloides* and *Drimys winteri* are dwarfed by the strong westerly and southwesterly winds and are restricted to draws. Tussock grass is well established on the windward slopes and numerous large



Figure 5. Magellanic moorland. Location: Bahía Flinders.



Figure 6. Alpine. Location: mountain peak between Bahía Alexander and Bahía Capitan Cánepa.

cushions (1 to 1.5 meters in diameter) of *Bolax gummifera* are conspicuous in the extensive *Marsippospermum grandiflorum* meadow on top of the cape. This locality is the only site where the giant petrel (*Macronectes giganteus*) was seen nesting. This section of Isla de los Estados is floristically reminiscent of sites in the Falkland Islands (Islas Malvinas) (Imshaug, personal communication).

Of particular interest is the near absence of introduced species on Isla de los Estados. Field mouse-ear chickweed (*Cerastium arvense*) is present, but is infrequent and restricted to coastal sites. Similarly, only single occurrences of common mouse-ear chickweed (*Stellaria media*) were noted. Only one specimen of dandelion (*Taraxacum officinale*) was found, a plant that occurs abundantly in disturbed sites on Isla Grande, Tierra del Fuego.

Sagina procumbens, an introduced Eurasian species that occurs widely in disturbed habitats



Figure 7. *Marsippospermum grandiflorum* association in foreground. Hillside in background is covered with *Nothofagus betuloides*-*Marsippospermum grandiflorum* association. *Nothofagus antarctica* association appears as "bare" patches on the upper slopes and the summit.

on Isla Grande, Tierra del Fuego, and in fact widely throughout the subantarctic, is entirely absent from Isla de los Estados (Crow, 1974). The near absence of weeds is especially noteworthy since Puerto Cook was the site of a prison operated by the Argentine government at the turn of the century (Bridges, 1948; Skottsberg, 1909). Skottsberg makes brief reference to some occurrence of weeds at this site; however, now no evidence of habitation can be observed except for crosses marking gravesites. The relative absence of weed species on the island can most probably be attributed to a scarcity of sites with a mineral soil rather than peat, as weeds are generally colonizers of disturbed sites with a mineral soil. The very wet, cold climate favors peat formation and the peat accumulations would tend to exclude weedy species, even in somewhat disturbed sites.

In addition to plant specimens, peat cores were taken from three sites (Puerto Vancouver, Puerto



Figure 8. Maritime tussock formation. *Poa flabellata*. Location: Isla Alfredo Goffré.

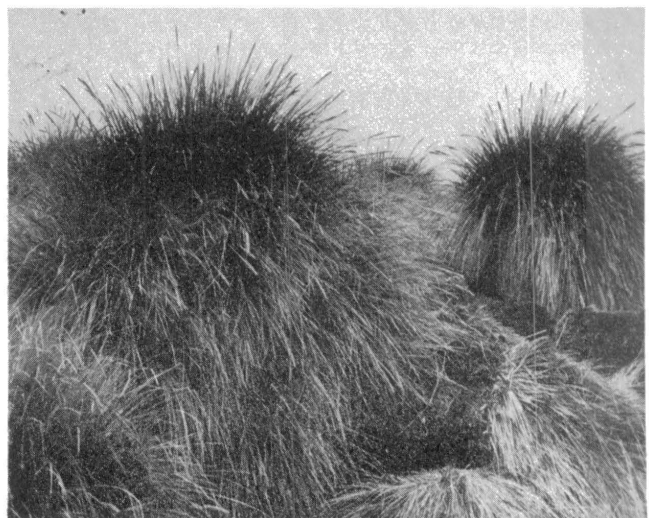


Figure 9. Tussocks of *Poa flabellata*. Location: Isla Alfredo Goffré.

Celular, and Bahía Crossley) with the greatest depth reached being 9.5 meters at Bahía Crossley. A pollen analysis is being carried out by Ralph Taggart, Michigan State University, which will hopefully shed new light on the post-Pleistocene climatic and vegetational history of the Fuegian region. A paper on the vegetation of Isla de los Estados, past and present, is in preparation by Dr. Taggart and me.

The success of *Hero* cruise 71-5 is due in no small part to the dedicated support of Captain Liberty and his crew. Gratitude also is expressed to Dr. H. A. Imshaug, chief scientist of the expedition. I thank Drs. D. M. Moore, Imshaug, and Dudley, and Mrs. Goodall for their critical review of my manuscript.

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