

# Kelp Inventory, 1976

Part 3. North & West Coasts

Graham Island (Q.C.I.)

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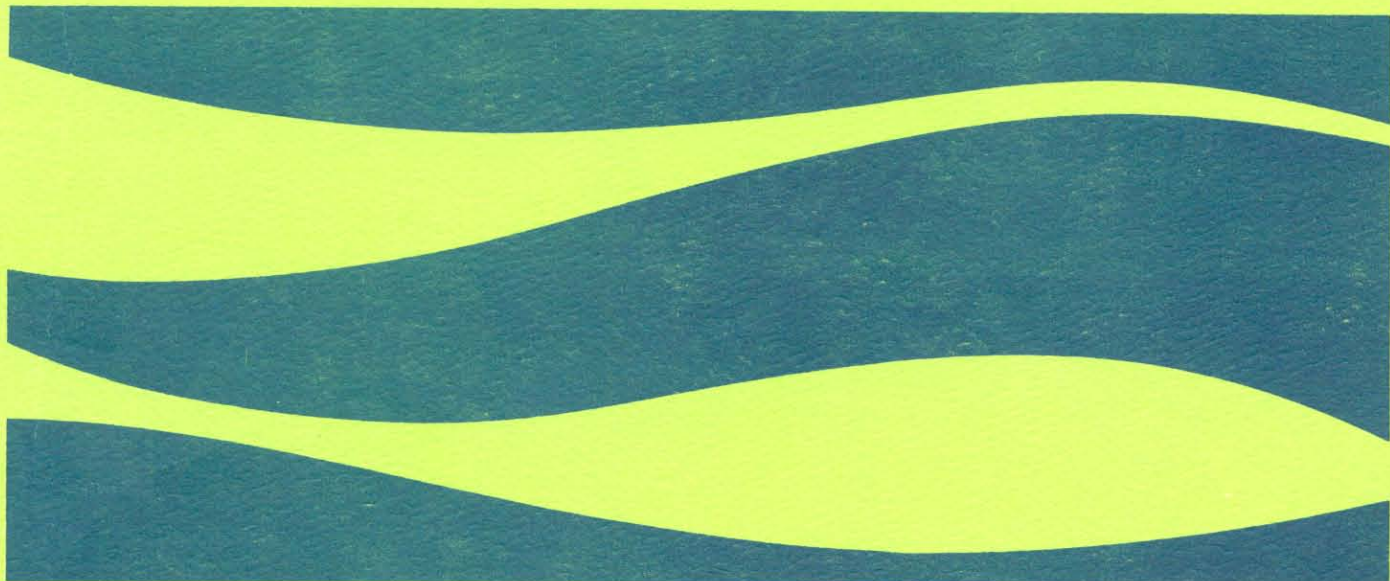
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**marine resources branch**

Ministry of Environment  
PROVINCE OF BRITISH COLUMBIA

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KELP INVENTORY, 1976. PART 3

NORTH AND WEST COASTS GRAHAM ISLAND

(QUEEN CHARLOTTE ISLANDS)

by

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## Introduction

In 1976 the Marine Plant Section of the Marine Resources Branch undertook a program to locate and quantify the standing crop of the economically important canopy-forming kelps, *Macrocystis integrifolia* Bory and *Nereocystis leutkeana* (Mertens) Postels and Ruprecht. Five areas were surveyed in August and September, 1976; this report on the kelp stocks of the northwest and north coasts of Graham Island, in the Queen Charlotte Islands, is the third of the series (Field *et al.*, 1977; Field and Clark, 1978). Foreman (1975) developed the basic survey method (KIM-1) used in this program.

Kelp inventory data provide information vital to the evolving kelp management program in British Columbia. Data are collected to provide a basis for resource allocation through licencing, and for establishing area-specific harvest quotas.

Because kelp beds are important to other marine species, there are a growing number of other users of kelp inventory data, particularly those preparing environmental impact statements for major coastal developments or oil transport systems. Inventory charts will also be of value to those conducting surveys of herring spawn, abalone and sea urchins (Coon, 1977).

The north coast of Graham Island, the largest land mass of the Queen Charlotte Archipelago, has long been reported to support some of the most extensive kelp beds on the coast of British Columbia. Yet commercial attention did not focus on these kelp resources until 1966. Apparently the relative isolation of the Queen Charlotte Islands accounted for their being neglected by early kelp survey efforts (Cameron, 1916; Anon., 1947).

North Pacific Marine Products Ltd. was granted kelp harvesting licences covering the whole of the Queen Charlotte Islands in late 1966. In 1967 the company performed an inventory of the kelp stocks

between the Mazarredo Islands and Kliki Damen Creek (Figure 1) on the North Coast of Graham Island (Norpac, 1967). In 1969 the company, renamed Canada Kelp Ltd., encountered financial difficulties and went into receivership before their kelp meal plant and harvester were completed.

In 1973, Equatorial Resources Ltd. purchased the Masset kelp processing plant which had been abandoned by Canada Kelp Ltd. A subsidiary, Kelpac Industries Ltd., attempted to modify the plant and produce kelp meal. Financial problems also forced the abandonment of this commercial attempt about a year and a half after it carried out a trial run of the plant in the late summer of 1973 (Whyte and Englar, 1974).

Spurred by the previously described resource development effort, a team with joint Federal-Provincial funding undertook a second inventory of the floating kelp resources in this area during August-September, 1973 (Blakely and Chalmers, 1973). This survey was limited to a region within an 18 mile radius of Masset; this was generally believed to be the economical operating range of a kelp harvesting vessel.

This region was further visited by Marine Resources Branch staff who, in 1974, conducted a preliminary study of the impact of harvesting on *Macrocystis* regrowth in McIntyre Bay (Coon and Roland, 1979).

This report presents the results of the 1976 Marine Resources Branch survey of the standing crop of *Nereocystis* and *Macrocystis*, along the northwest and north coasts of Graham Island. The results are compared with those obtained in the two earlier surveys.

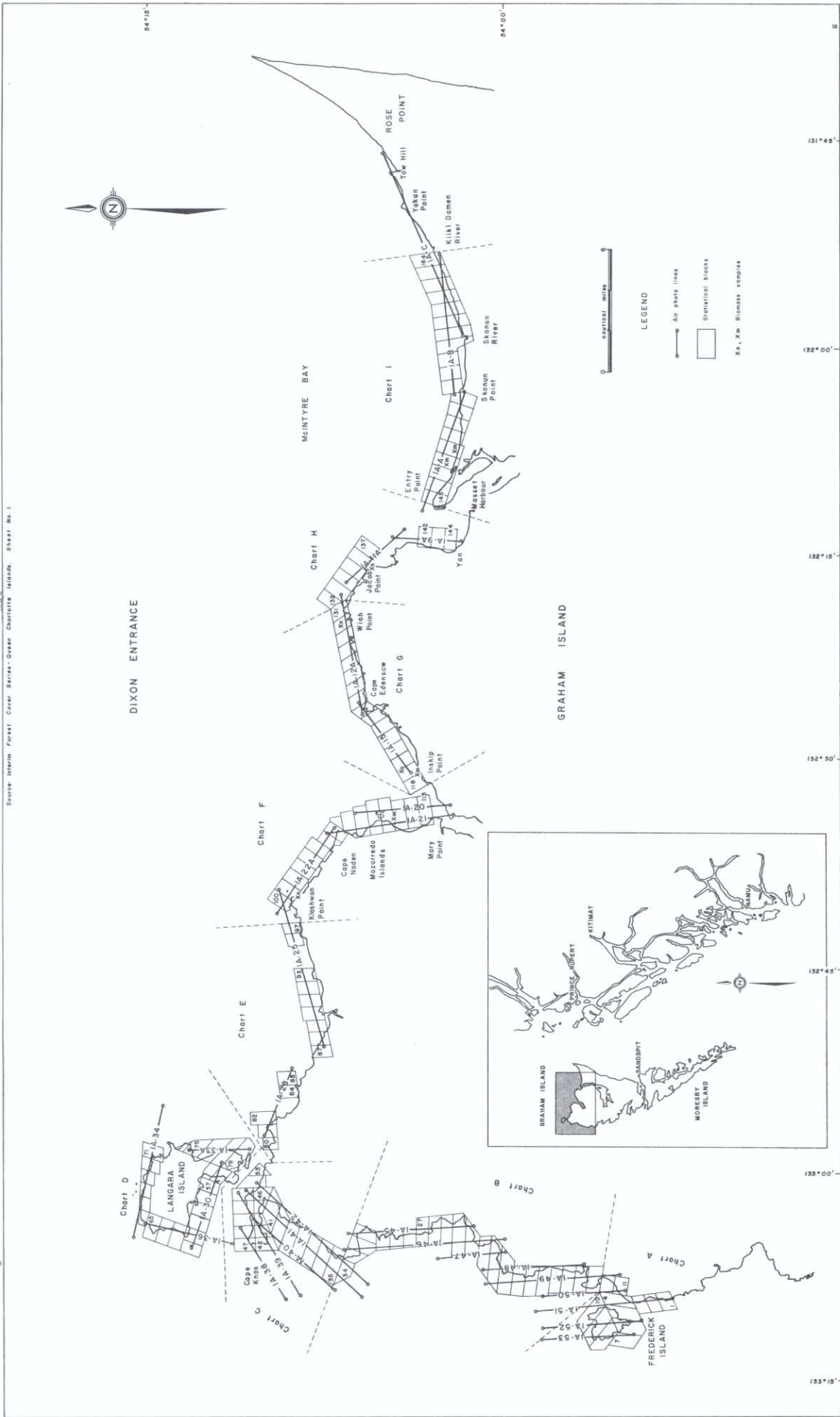


Figure 1: The north and west coast of Graham Island (Q.C.I.), showing the area inventoried for floating kelp resources and the mode of division of this area into inventory charts (see Appendix). Also indicated are the layout of statistical blocks, aerial photographic flight lines and locations of biomass sampling stations.

## Methods

Bed areas, plant or frond densities and biomass of *Nereocystis* and *Macrocystis* were determined by the Kelp Inventory Method (KIM-1) established by Foreman (1975). Modifications of the method as stated by Coon *et al* (1976) and Field *et al* (1977) were employed in this study. Briefly, the KIM-1 technique involves obtaining black and white infrared aerial photographs of the kelp bed and shoreline in the desired region. These photographs are used to prepare charts of the coastline and the offshore kelp beds. On these charts the survey area is divided into 1 km wide statistical blocks. Bed areas for each of six bed types listed below are determined for each block. The density of kelp is determined directly from the photographs with the aid of a microscope. Field crews obtain samples of kelp from the area for mean weight per plant (*Nereocystis*) or frond (*Macrocystis*) determination, near the time that the beds are photographed. The total available kelp per block is determined by multiplying the mean weight per plant/frond values by the observed plant/frond densities and multiplying this product by the observed bed areas. The KIM-1 technique identified six bed types on the basis of:

- a) species - *Macrocystis* or *Nereocystis*
- b) stand purity - pure bed or mixed (42% *Nereocystis* and 58% *Macrocystis*; Foreman, 1975)
- c) plant or frond density - low (less than 10 plants/fronds /m<sup>2</sup>) or high (greater than 10 plants/fronds/m<sup>2</sup>).

The vertical distribution of kelp biomass in the water column was determined along the northwest coast of Graham Island during September 12 - 14, 1976. Random samples of 25 *Nereocystis* plants and 25 *Macrocystis* fronds were gathered at four stations for each genus (Figure 1) in areas selected to be representative of and proportional to the bed depth ranges and exposure environments in the survey area. These plants were cut into 1 m sections and the weights of each section recorded.

