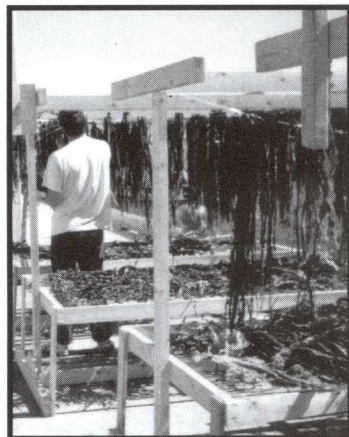


# PROJECT SUMMARY

## *Experimental Kelp Development*

CAFID #14

1995



### BACKGROUND

Traditionally Newfoundlanders have harvested kelps and seaweed as animal feed and as a soil conditioner for crops. In recent years there has been increased interest in the potential for commercializing Newfoundland's kelp and seaweed resources.

Today, there are established commercial markets for kelps and seaweed in the agriculture industry (fertilizers, soil conditioners), the pharmaceutical industry, the food industry (direct consumption) and

industrial uses (extraction of agar and carrageenin).

In 1994 the Penguin Area Development Association which coordinates and promotes economic development in the areas of Ramea, Burgeo, Grey River and Francois, initiated a preliminary study to identify kelp resources and seaweed in the immediate area.

Conservative estimates indicated that sufficient concentrations of various seaweed species existed to warrant further study.

In 1995, the Penguin Area Development Association approached the Canada/Newfoundland Cooperation Agreement for Fishing Industry Development (CAFID) for assistance to conduct a pilot project to harvest, process and test market approximately 20,000 lbs of various kelp and seaweed species to further define potential opportunities.

Due to a lack of information with respect to the total biomass available, the focus of the pilot project targeted high quality products for the food and pharmaceutical industries, which would require low volumes of raw material.

## THE PROJECT

The Development Association applied for and received an experimental license to harvest 17,100 lbs in total of the following species in the Ramea area:

- Rhodymenia palmata (dulse)
- Laminaria longicuris (kelp)
- Saccorhiza dermatodea
- Ascophyllum nodosum (rockweed)
- Fucus (rockweed)
- Alaria esculenta (kelp)

### Harvesting

Harvesting operations were carried out between August 1 and September 30, 1995. Five harvesters were involved and harvested approximately 10,000 lbs of the various species using knives and modified rakes with a net bag attached (see Figure 1).

Rockweeds were harvested over a wide area leaving 8 - 10 inches from the base of the plants. Thinning a number of *Alaria* and *Laminaria digitata* beds was carried out providing opportunity for re-growth.

Harvesting took place at low tides (see Figure 2), either from a 14 foot boat or by wading.

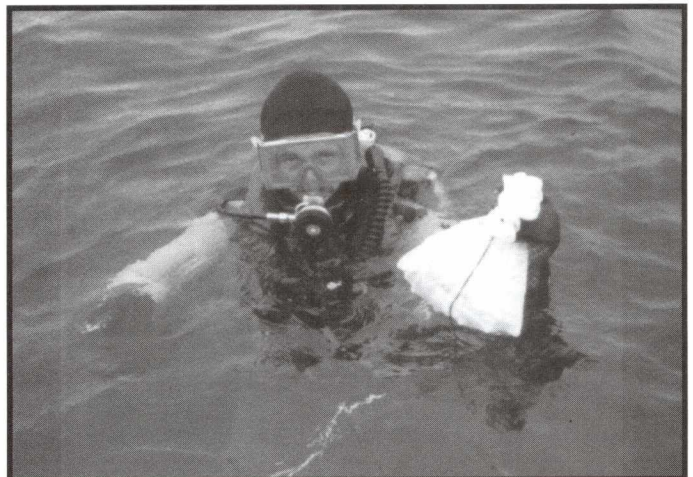
Divers were used to tag and measure plants at two sites on the north side of Ramea Island as a means of measuring growth rates (see Figure 3). One hundred and thirty-two plants were tagged in



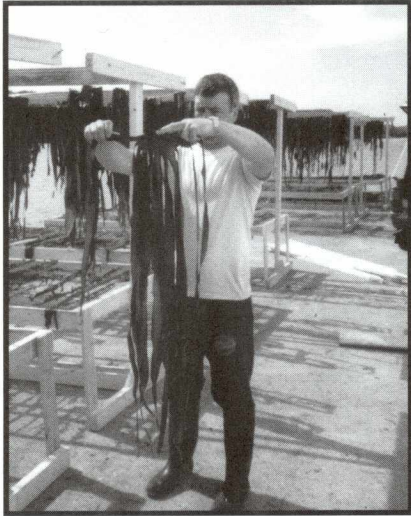
*Figure 1: Harvesting rake with net bag attached.*



*Figure 2: Harvesting Alaria around shoreline at low tide.*



*Figure 3: Diver ready to tag plants.*



*Figure 4: Laminaria digitata drying on racks.*

September and re-visited in February. It was anticipated that the information would be used to assess growth and survival rates in the area. Because of strong tide conditions and grazing by sea urchins in the area, none of the plants were in tact in March when the sites were re-visited.

### **Drying and Processing**

Harvested product was brought to the fish plant in Ramea for processing. Eight, 4' x 8' portable drying racks were constructed. Racks were filled with kelp or seaweed for drying outside in the day and stored inside plant at night. Semi-dried seaweed stored overnight tended to rehydrate due to the high moisture levels in the building. Therefore an alternate storage area was found in a building which was approved for use by DFO Inspection Branch.

Primarily all products were dried outdoors, hung either on racks, spread on flakes or on the beach (see Figures 4 and 5).

Drying times ranged from two to three days during good weather conditions. Moisture levels were brought down to approximately 20%.

A finishing dryer was used to dry products down to 10 to 13% moisture so products could be later shredded or ground.



*Figure 5: Ascophyllum on flakes; Digitata on racks.*

The finishing dryer was a makeshift mechanical dryer constructed from wood (see Figure 6). It was 6' x 6' x 8' high, painted and covered in plastic. Racks were made of monofilament netting or window screen. Hot air from a ceramic heater located under the dryer was piped into the dryer and circulated using a hot air furnace blower. An exhaust fan located at the top of the dryer piped out moisture from the drying seaweed. Temperature inside the dryer was regulated at 68 to 75 degrees Fahrenheit. Semi-dried seaweed (280 lbs/load) was placed in the dryer overnight to reach the desired moisture content of 10 to 13%.



*Figure 6: Finishing dryer.*

After the product was removed from the finishing dryer, it was shredded using a 5-horsepower gas powered chipper/shredder at a rate of 360 lbs per hour (see Figure 7).

A portion of the shredded product was then fed through the grinder for a finer particle product.

### **Product Samples for Test Marketing**

Kelp and seaweed were produced in various forms including dried whole, course, fine and extra fine granules and packaged for test marketing purposes.

Samples of the dried kelp and seaweed products were assessed for determination of the nutritional content.

Samples have been provided to numerous companies locally, nationally and internationally. Responses to date have been positive.



*Figure 7: Shredding Laminaria digitata.*

## **RESULTS AND CONCLUSIONS**

Kelp and seaweed harvesting can be carried out from May up to the end of August in the Ramea area. After this time quality of the kelp deteriorates rapidly, prior to May weather conditions are not conducive to harvesting.

The biomasses of the various species in the area need to be determined.

The Development Association has concluded they will continue with the development of the kelp resources in the area.

A sample analysis information package is being produced to send to prospective clients.

The association plans to target the food and pharmaceutical industries which utilize low volume, high valued products.

## **THE CAFID PROGRAM**

The Cooperation Agreement for Fishing Industry Development (CAFID) is a multi-year development agreement jointly administered and delivered through the Federal Department of Fisheries and Oceans (DFO) and the Provincial Department of Fisheries and Aquaculture (DFA). The objective of the Agreement is to assist the Newfoundland fishing industry to be self-sustaining and viable in the present resource short environment.

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