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DISCOVERY OF AN EXTENSIVE AREA OF *LAMINARIA SACCHARINA* IN MINAS BASIN, NOVA SCOTIA

Air photos taken along the shoreline of western Minas Basin, Nova Scotia, during an extreme low tide on 20 August 1978 revealed an extensive bed of *Laminaria saccharina* extending from Cape Blomidon southwards for approximately 8 km to Medford Beach (Fig 1). Because of the natural turbidity of these waters, the full width of the bed could not be determined from the air but was 300 to 400 metres wide at several places. Although our "scientific community" was unaware of the macrophyte beds of this magnitude, subsequent enquiries revealed that local fishing draggers purposely avoid this heavy seaweed area, and local residents seasonally harvest a lucrative dulse (*Palmaria palmata*) crop from within this *Laminaria* zone. Over 20 other species of algae are in this community including *Chondrus crispus* and *Corallina officinalis*.

The substrate over much of this area is ledges of Blomidon shale but the *Laminaria* holdfasts also attach to loose stones, an indication of the low energy aspect of

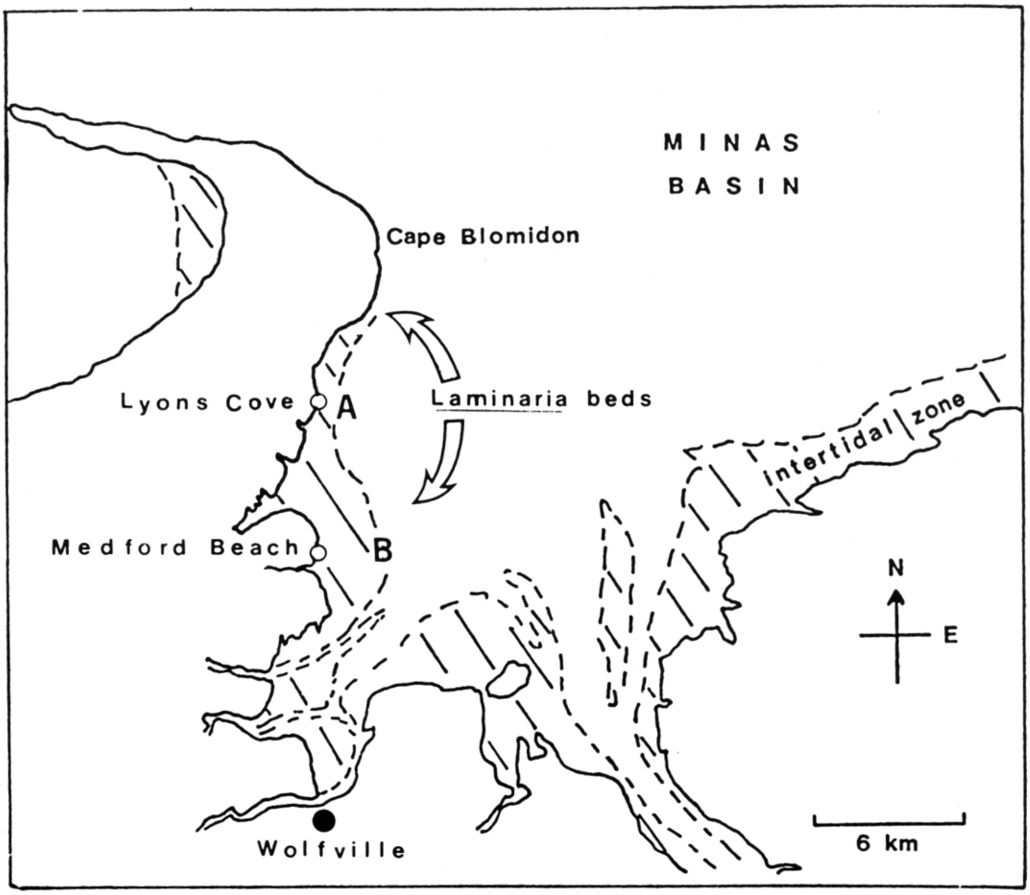

Fig 1 Western area of Minas Basin, indicating extent of *Laminaria saccharina* beds.

this shoreline. In fact, one reason the discovery of the beds was so surprising, is that *Laminaria* plants rarely are found at the strand line in this part of Minas Basin. Off Medford Beach, *Laminaria* even attaches to stones partially buried in the sands of an extensive megaripple area.

In the summer of 1980, growth rates of 204 of these intertidal (from 0 to 0.8 m above Datum) *Laminaria* were measured. The blades were generally 0.5-2 m in length, and, following the method of Mann (1973), a 5 mm hole was punched in the blade 10 cm from the junction of stipe and blade. Blades were then remeasured on the subsequent spring tides to determine the rate at which the hole was receding from the stipe junction. Few marked blades were found more than once as many plants attached to small rocks had been moved about during the intervening time. Therefore additional blades were punched on each field trip.

From mid-May to the end of July, linear growth was constant at about 1.1 cm/day. This was followed by a small (but significant, t-test, $p < 0.05$) decline to 0.9 cm/day during August.

In St. Margaret's Bay on the Atlantic coast of Nova Scotia, Craigie and Chapman (1977) determined that growth of *Laminaria* was related to nitrogen availability. They found a summer decline in growth rate following the depletion of nitrate reserves in the plant tissues, and a growth resurgence in late winter when relatively high concentrations of dissolved nitrates were in the water column. Artificial nitrate enrichment demonstrated that *Laminaria* could maintain a high growth rate throughout the summer. In Minas Basin, however, nitrate concentrations are high throughout the year (Keiser *et al.* in press) and should not be a limiting factor for algal growth.

Mann (1973) determined that grazing by sea urchins (*Stronglyocentrotus droebachiensis*) and periwinkles (*Littorina littorea*) accounted for not more than 10% of the net production of the seaweeds in St. Margaret's Bay. The remaining 90% eventually entered food chains as particulate or dissolved organic matter. In Minas Basin, the 90% figure is undoubtedly exceeded as sea urchins are rarely found in this area of Minas Basin and periwinkles are relatively scarce at these algal beds. On the Atlantic coast of Nova Scotia, *Laminaria* produce about 1200-1800 g $C/m^2/yr$ with annual growth of about 200 cm/plant (Mann 1972). As Minas Basin beds may exceed those calculations, it is evident that future modeling of the Minas Basin ecosystem will require firm figures of the dimensions of this algal area and calculations of its potential as a significant source of detritus.

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