

## H2.2 BOULDER/COBBLE SHORE

*Boulder/cobble-shore habitats are exposed between the extreme-high-tide and extreme-low-tide marks.*

H2.2  
Boulder,  
Cobble Shore



Plate H2.2.1: An example of a cobble-shore habitat at Cape Sable Island (Unit 841), Shelburne County Photo: A. Wilson

### FORMATION

Boulder/cobble shores form where there is erosion of glacial till on headlands and islands. In high-energy situations, the cobbles may form a storm beach at and above the high-tide mark. In intermediate- and low-energy situations, the boulders rest on a wave-cut platform.

### PHYSICAL ASPECTS

1. *Substrate*: boulders provide a relatively stable hard substrate. Cobbles and pebbles are usually mobile.
2. *Wave action*: in high-energy situations, exposure to wave action, related to dominant wind direction, storms and ocean-swell conditions, the boulders and cobbles are mobile, limiting colonization by intertidal organisms.
3. *Tidal regime*: tide range determines the area of shore that is exposed to the air.
4. *Water-land interaction*: water conditions include summer and winter temperature extremes, formation and movement of ice, and variations in turbidity and salinity.
5. *Climatic conditions*: air conditions include summer and winter temperature extremes, humidity, precipitation and wind exposure.

## ECOSYSTEM

Primary production within the habitat is limited to the seaweed growth, which is very limited or absent in exposed situations. Energy also enters the system through primary production in the plankton, and through suspended organic detritus derived from the land and adjacent intertidal habitats. There are herbivores and detritus-feeders in the epifauna, but populations are often small. These animals are preyed upon by carnivores, including birds.

## PLANTS

Mainly algae (seaweeds) colonize the surfaces of boulders. In intermediate- and low-energy situations, there is horizontal zonation related to the period of exposure at low tide.

### *Upper Shore*

On the upper shore, where the cobbles are easily moved by wave action, there is no seaweed growth, but some lichens and flowering plants occur above the high-tide mark.

### *Middle Shore*

On the middle shore, in sheltered conditions, there is a narrow black band of algae and lichens below which brown seaweeds, *Fucus* spp. and *Ascophyllum nodosum*, are conspicuous. Various filamentous algae are present in the spring. Cord Grass may be found growing in mud and gravel between the boulders at lower levels. In more exposed situations, the seaweed growth is limited by the movement of the boulders and cobbles. Where seaweeds do occur, there is usually a sparse growth of the brown seaweeds, with Irish Moss and the calcareous species *Corallina officinalis* and *Lithothamnium* spp. growing in the lower zone.

## ANIMALS

The movement of boulders and cobbles in high-energy situations severely limits colonization by animals. In low and intermediate energy situations, barnacles, isopods, amphipods, periwinkles, Green Crabs, Dog Whelks, Blue Mussels and Purple Starfish are often present.

## SPECIAL FEATURES

- On exposed, high-energy shores, the cobbles are often washed up to form a storm beach or berm. As they are largely beyond the reach of

wave action, the cobbles are more stable and become colonized by encrusting lichens and flowering plants, such as Sea-lungwort and Beach Pea. Animal life is limited to various species of amphipods and fly larvae, which feed on decaying seaweed cast up by storms. Spiders and birds prey upon these animals.

## DISTRIBUTION IN NOVA SCOTIA

Boulder/cobble-shores are found along the whole Nova Scotia coastline but are best developed along the Atlantic coast where there is sufficient glacial till source material. In St. Margarets Bay and Mahone Bay (District 460), for example, eroding drumlins have boulder and cobble beaches with varying degrees of exposure. The islands eventually erode away to leave boulder reefs visible only at low tide. Sheltered boulder beaches occur at the head of inlets, such as in Head Harbour (sub-District 460b).



### **Associated Topics**

T6.1 Ocean Currents, T6.2 Oceanic Environments, T7.1 Modifying Forces, T7.2 Coastal Environments, T7.3 Coastal Landforms, T10.9 Algae, T10.11 Lichens, T11.6 Shorebirds and other Birds of Coastal Wetlands, T12.7 The Coast and Resources

### **Associated Habitats**

H1.1 Open Water, H1.2 Benthic, H2.1 Rocky Shore, H2.3 Sandy Shore, H2.4 Mud Flat, H2.5 Tidal Marsh, H2.6 Dune System, H5.1 Barren, H5.3 Cliff and Bank

### **Additional Reading**

- Davis, D.S. (1972) The Atlantic Shore. Nova Scotia Museum, Halifax. (*Environmental Studies Series*).
- Davis, D.S. (1972) The Fundy Shore. Nova Scotia Museum, Halifax. (*Environmental Studies Series*).
- Davis, D.S. (1972) The Northeast Cape Breton Shore. Nova Scotia Museum, Halifax. (*Environmental Studies Series*).
- Davis, D.S. (1972) The Northumberland Strait Shore. Nova Scotia Museum, Halifax. (*Environmental Studies Series*).
- Stephenson, T.A. and A. Stephenson (1954) "Life between tidemarks in North America, III A, Nova Scotia and Prince Edward Island: description of the region." *J. Ecology* 42.