H5.4 TALUS SLOPE

A talus slope is an accumulation of rock debris at the base of a cliff or steep mountain slope. Generally, in its early stages of development, it is so unstable as to inhibit growth of vegetation other than the nonvascular plants. Talus slopes are also known as scree slopes.

Plate H5.4.1: Unstabilized talus slope at the base of gypsum cliffs at the Hayes Cave site in Hants County (Unit 511). Photo: R. Merrick.

FORMATION

A talus slope begins with the weathering and mass-wasting of a cliff face in which the loosened rock accumulates at the base of the cliff.

PHYSICAL ASPECTS

1. *Bedrock:* variable but predominantly hard igneous and metamorphic rock.
2. *Soils:* rock fragments; Regosolic soils in crevices.
3. *Relief:* hilly to mountainous topography with steep-sided slopes, particularly along deeply incised river gorges.
4. *Drainage:* very rapidly drained; a xeric upper slope, as opposed to a more mesic lower slope, where the accumulation of finer material and a greater amount of vegetation provides for better water-holding capability.

ECOSYSTEM

H5.4
Talus Slope

Talus, the accumulation of inorganic material at the base of a steep-sided slope, can be found in two extreme forms in Nova Scotia. Boulder talus is characteristic of granitic or other hard-rock areas and consists of large boulder fragments, which tend to lodge together to form fairly stable sloped surfaces. A gravel slide, on the other hand, is predominantly found in soft-rock (sedimentary) and highly fractured metamorphic rock (especially slates) steeply sloped areas. This talus type consists primarily of loose, finer rock debris not held together and thus constantly moving downslope. This results in a very unstable surface. The type of vegetation and its successional sequence is very dependent on the steepness of the talus slope and the type of surface, owing to the inability of many plant species to secure a foothold on an unstable steep rock surface.

SUCCESSIONAL SEQUENCE AND PLANTS

Two types of habitat are available to the plants colonizing a boulder talus: the rock surfaces and the crevices between adjoining rock fragments.

On the rock surfaces, there is little or no successional trend to speak of, since this habitat is almost exclusively covered with crustose and foliose lichens. Typical crustose lichens—*Buellia, Lecanora, Lecidia,* and *Rhizocarpon* spp.—appear on the rock surface first, followed by the foliose lichens *Parmelia* and *Gyrophora*. The fruticose lichen *Stereocaulon* and lithophytic mosses, such as *Hedwigia ciliata* and *Grimmia apocarpa,* may also be present. *Cladonia rangiferina* may be found in shallow hollows on the rock surface itself, eventually spreading itself outward to cover the entire rock surface. Mixed in with this mat of Reindeer moss may be the mosses *Rhacomitrium lanuginosum* and *Polytrichum* spp.

The crevices between the rock fragments provide shade, moisture and the beginnings of soil, and, as a whole, are responsible for succession withinthe boulder talus habitat. Here, the slow disintegration of larger rock fragments into finer particles, along with accumulation of extraneous material, results in the formation of a soil. The lower slope tends to accumulate more soil more quickly and soil moisture is more abundant. Thus, the lower slope crevices tend to be colonized by vascular plants first, and succession will proceed at a much greater pace here than further up the slope. The crevice habitat can support mesophytes as well as xerophytes. The pioneer plants consist of *Cladonia* spp. and bryophytes such as *Creatodon purpureus, Leucobryum glaucum, Dicranum scoparium, Dicranum* spp., *Polytrichum piliferum, Ptilidium ciliare, Pleurozium schreberi,* and *Hylocomium splendens.* This lichen–moss association is an important link in the successional sequence, since it provides an excellent seedbed for the vascular plants. Herbaceous and shrub plants are sparingly represented by *Polypodium virginianum, Sambucus pubens,* and *Rubus* spp. In the early stages of talus development, trees tend to be scattered, because of the continued dislodging of boulders from above. As the slope stabilizes somewhat, White Birch is the first to invade the crevices. Its ability to regenerate through stump sprouting enables it to recover from the battering force of falling rocks. Later, Balsam Fir, White and Black Spruce, Yellow Birch, White Pine and Mountain Ash invade the habitat. Sugar Maple colonize the habitat on the lower slopes.

A gravel slide is a second form of talus habitat. Due to the high degree of instability, lichens and

mosses do not play a significant role in the successional trends of this habitat. The more important pioneer species include the xerophytic plants, such as Wire Grass, Harebell, Pussy-toes and Silver rod. Most of the common weed species found on pastures and along roadsides can be found in this habitat. Wire Grass, brambles and White Spruce are particularly important in helping stabilize the slope material. Continued instability due to the undermining of the base of the talus slope by a river or the sea may prevent colonization from ever proceeding further. Eventually a closed canopy of conifer trees may develop if stable conditions occur, which in turn may be superseded by a regional climax-forest type.

ANIMALS

The animal life is sparse. On rock surfaces, it is limited largely to insects and spiders. On well-forested stabilized slopes, the habitat becomes important for land snails such as *Zoogenetes harpa* and *Vertigo* spp., and for small mammals. In Cape Breton Island, these areas are special habitat for Rock Vole and Gaspé Shrew.

SPECIAL FEATURES

- Instability of habitat
- Sparse flora and fauna
- Geologic processes

DISTRIBUTION IN NOVA SCOTIA

The talus habitat is found in hilly-to-mountainous upland areas characterized by steep-sided cliffs and deeply-cut river ravines throughout the province, especially in District 220 and throughout Regions 300 and 700.

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Associated Topics

T3.1 Development of the Ancient Landscape, T3.2 Ancient Drainage Patterns, T3.3 Glaciation, Deglaciation and Sea-level Changes, T3.4 Terrestrial Glacial Deposits and Landscape Features, T10.2 Successional Trends in Vegetation, T10.4 Plant Communities in Nova Scotia, T10.6 Trees, T10.7 Pteridophytes (Ferns and their Allies), T10.8 Bryophytes (Mosses, Liverworts and Hornworts), T10.11 Lichens, T11.11 Small Mammals

Associated Habitats

H3.1 Open-water Lotic (Rivers and Streams), H3.5 Water's Edge Lotic (Rivers and Streams), H5.3 Cliff and Bank, H6.1 Hardwood Forest.

Additional Reading

- Eastern Ecological Research (1978) *Cape Breton Highlands National Park: Ecological Land Classification*. Parks Canada.
- Daubenmire, R. (1968) *Plant Communities: A Textbook of Plant Synecology*. Harper and Row, New York.
- Nichols, G.E. (1918) "Vegetation of northern Cape Breton." *Trans. Conn. Acad. of Arts Sci.* 22.