H5.1 BARREN

The barren habitat is a rocky heathland with dwarf shrub and lichen vegetation that occurs in Nova Scotia along the Atlantic coast as well as inland.

Plate H5.1.2: West Dover Barrens, Halifax County (Unit 851). Glacial erratics dominate the open landscape, which supports stunted spruce trees (krummholz) and sparse heath vegetation. Exposed bedrock at the edge of the barrens grades into rocky-shore habitat (H2.1). Photo: R. Merrick

FORMATION

Four factors may be involved in the development of barrens:

1. the effects of ice action during glaciation scraping over hard rocks and leaving only a thin residue of coarse till with numerous boulders;
2. the formation of a hardpan layer (ortstein) which is impenetrable to roots;
3. the effects of fire, stripping humus from the soils. Repeated deep burns appear to favour the development of lichen dominated barrens;
4. rigorous climatic conditions.

The extensive barrens of southwest Nova Scotia (District 440 and Unit 452) show evidence of repeated burning. In many areas, especially in District 440, the presence of a hardpan may prevent any natural recolonization by trees. Hardpans are also found in Cape Breton Highlands (Region 100). The coastal barrens tend to have just a thin, patchy soil cover over bedrock. In many cases the relative importance of fire is not certain–pollen studies in south-western Nova Scotia suggest that a shift towards shrub vegetation may have started long before European settlement in response to climatic deterioration. Harsh climatic conditions are the greatest influence on some of the Cape Breton high altitude barrens and coastal barrens on exposed headlands.

PHYSICAL ASPECTS

1. *Bedrock:* usually granites, quartzites and schists.
2. *Soils:* thin, coarse, gravelly till over compacted material or bedrock; low moisture-holding capacity; strongly acidic.
3. *Relief:* only moderate changes in elevation—rolling hills, flat areas, ridges (especially over quartzite) and knolls.
4. *Drainage:* usually associated with irregular, sluggish, meandering streams, with peat accumulation and oligotrophic-bog formation in depressions.

ECOSYSTEM

Barrens are essentially impoverished habitats, with low nutrient availability and low floral diversity, offering a comparatively small number of niches.

SUCCESSIONAL SEQUENCE

The present successional status of barrens may depend largely on the role of fire in their development (which cannot always be determined). On many sites, the shrub–lichen vegetation may represent the climax stage as related to the existing soil conditions. Change would come about only very slowly as a result of soil development. On other sites, if fire does not intervene, some form of dwarf Black Spruce forest cover may eventually develop.

PLANTS

Barren conditions favour ericaceous (heath) vegetation and lichens. Ericaceous plants are usually woody, acid-tolerant and very resistant to drought. Lichens are a pioneer vegetation type, in this case colonizing exposed rock. They can also survive very dry conditions.

Coastal barrens:
(Region 800, especially District 850)
Reindeer Moss (*Cladonia spp.*), Broom Crowberry or Black Crowberry

Highland barrens: (Region 100)
Reindeer Moss *(Cladonia rangiferina), Cladonia alpestris*, Sheep-Laurel, Rhodora, Blueberry, Black Crowberry, Labrador Tea

Inland barrens: (District 440, Units 452 and 413)
Broom Crowberry, Huckleberry, Blueberry, Sheep Laurel, Reindeer Moss, Bearberry, Rhodora

On all barrens, some stunted trees may be found, usually Black Spruce or Larch. In southwestern Nova Scotia, there may also be relict White or Red pines; in Cape Breton, Balsam Fir may be found.

ANIMALS

The low diversity of plant types and the harsh, dry conditions of the barren do not provide productive habitat for animals. The soil fauna is poor, and those animals that do occur are largely found in protected situations, such as rock crevices. Pyralid moths are important, and their larvae are common on the low vegetation.

The American Toad, Northern Redbelly Snake and Maritime Garter Snake commonly occur. The only bird species frequently nesting in the inland barrens are the Nashville Warbler and Common Yellowthroat. Such seabirds as Storm-petrel nest

on coastal barrens, particularly on islands. The only mammals that commonly occur are the Cinerous Shrew and Meadow Vole. Other types of birds and mammals, including Moose and Black Bear, will visit barrens from adjacent habitats, particularly during the Blueberry season.

SPECIAL FEATURES

- *Hummock development:* successive layers of lichens growing up through shrubs, smothering the branches, gradually build up hummocks composed entirely of incompletely decomposed humus.
- *Krummholz:* stunted tree growth results from harsh climatic exposure. Trees exhibit dense, lateral branching.
- *Polygonal patterns (southwestern Nova Scotia):* Lines of small boulders occur, having been preferentially sorted in late glacial and immediate post-glacial time by freezing and thawing.

DISTRIBUTION IN NOVA SCOTIA

Major coastal barrens are found in Halifax County and Guysborough County (District 850). Other large barren systems occur on the plateau surface of the Cape Breton highlands, to the east of the Liscomb Game Sanctuary (Unit 413b), Shelburne County (Unit 452) and the Tobeatic Game Sanctuary (District 440).

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Associated Topics

T10.2 Successional Trends in Vegetation, T10.4 Plant Communities in Nova Scotia, T10.5 Seed-bearing Plants, T10.11 Lichens, T11.9 Carnivores

Associated Habitats

H4.1 Bog

Additional Reading

- Eastern Ecological Research (1978) *Cape Breton Highlands National Park: Ecological Land Classification*. Parks Canada.
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H5.2 OLDFIELD

Oldfield habitats originate from cultivated land and are associated with the farming industry in the past.

Plate H5.2.1: Alders growing in an oldfield, St. Marys River Valley, Pictou County (Unit 572). Photo: R. Merrick.

FORMATION

The oldfield habitat has been with us since the Europeans immigrated to the province's shores. In lowland areas, the first settlers cut and burned vast areas that were originally forested, in order to grow crops for themselves and their livestock. When abandoned, these fields rapidly return to a forest condition.

PHYSICAL ASPECTS

1. *Bedrock:* predominantly sedimentary and volcanic rocks.
2. *Soils:* variable but usually deep sandy to clay loams; soil horizons have been lost due to ploughing.
3. *Relief:* mostly flat to gently rolling topography
4. *Drainage:* imperfect to well drained.

ECOSYSTEM

The field habitat results from the human activities associated with food production on a relatively large scale. Cultivated fields and livestock pasture are the active forms of this habitat; old, abandoned fields soon revert to a forested habitat. Cultivated plant species and weed species dominate the habitat.

SUCCESSIONAL SEQUENCE

A fallow field is one which has been recently cultivated, but allowed to remain idle. With the cessation of tillage, the vegetation of open fields quickly reverts to an annual, followed by a perennial herb and grass community. On soils of poor nutrient status, *Polytrichum* mosses may become dominant in the development of a continuous ground cover.

In the succession of field to forest, the vegetation of neglected fields becomes interspersed with shrubs. Some tree species invade the abandoned field at an early stage. Young White Spruce seedlings may be seen growing among the tall grasses and perennials. If left undisturbed for several years, the field will generally revert to a White Spruce Forest (in H6.2). Where seed sources are available, oldfields can be colonized by White Pine. On wetter sites, Larch will exhibit similar characteristics to White Spruce, when colonizing these fields.

PLANTS

Pastures are grass-dominated fields, for livestock grazing during the summer months. Common pasture grass species include blue-grass (*Poa* spp.), bent-grass (*Agrostis* spp.), Timothy (*Phleum pratense*) and fescues (*Festuca* spp.). Many of the perennial grasses persist until trees dominate.

Secondary successional broad-leaved plants include Sheep-sorrel (*Rumex*), Spurry (*Spergula*), plantains (*Plantago* spp.), goldenrods (*Solidago* spp.), Yarrow (*Achillea*), Dandelion (*Taraxacum*) and thistles (*Sonchus; Cirsium*). Some of the long-persistent perennial herbs including Wild Strawberry (*Fragaria*), White Clover (*Trifolium*) and Pearly Everlasting (*Anaphalis*) are common. The shrub community composed of such plants as Juniper (*Juniperus*), raspberry (*Rubus* spp.), willow (*Salix* spp.), Meadowsweet (*Spiraea*) and Alder (*Alnus*), precedes the encroachment by conifers and early-successional hardwoods such as the aspens (*Populus* spp.).

ANIMALS

The animals present depend upon intensity of cultivation or the duration of neglect, as well as on site conditions and successional stage of regrowth. In the monoculture condition, invertebrates are few. The invertebrate fauna of abandoned fields is largely composed of insects and spiders. Many of the soil organisms are introductions from Europe, especially slugs and earthworms. Toads, Leopard Frog, Pickerel Frog, Eastern Smooth Green Snake, Northern Red-belly Snake and Maritime Garter Snake may be common. Many bird species forage in the habitat but nest in adjacent woodlands.

On moist, poorly drained sites in early succession with a higher diversity of invading plants, birds include Bobolink, Common Snipe, American Woodcock and Northern Harrier. Small mammals include Common and Short-tailed shrews, Meadow Voles and Meadow Jumping Mice. As the site succeeds into a later stage, dense alder growth provides habitat for many species of warbler, flycatcher and sparrow. High invertebrate populations in the alder succession attract insectivorous species. The Bobolinks disappear, snipe declines and the woodcock increases.

On drier upland sites in early succession, birds include Savannah Sparrow and Bobolink, and the mammals are generally similar to those found in moister conditions, with the exception of the Meadow Jumping Mouse. The diversity of species

increases as forest regeneration proceeds. Ruffed Grouse, Ring-necked Pheasant and Chipping Sparrow are common woodland species, while Junco and White-throated Sparrow inhabitat the edge. Mammal diversity increases to include Red-backed Vole, Snowshoe Hare and White-footed or Deer mice. Hawks and owls hunt for small mammals in the open areas; bear and deer are attracted by the old or wild apple trees.

SPECIAL FEATURES

- Succession from abandoned field to forest.
- Garden escapes; plants from old gardens surviving in a natural habitat.
- Tansy Ragwort and Cinnabar Moth in northern Nova Scotia.
- See Introduced Plants in Topic T12.10.

DISTRIBUTION IN NOVA SCOTIA

The field habitat is abundant throughout the province, generally wherever settlement has taken place but particularly in Region 500. Over two million acres are known to have been cleared throughout Nova Scotia at the end of the nineteenth century. Less than 500,000 thousand acres of cleared land are actively worked by farmers today.

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Associated Topics

T4 Colonization, T9 Soils, T10.2 Successional Trends in Vegetation, T10.4 Plant Communities in Nova Scotia, T10.5 Seed-bearing Plants, T10.6 Trees, T12.1 Colonization by People, T12.10 Plants and Resources

Associated Habitats

H6.2 Softwood 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.
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H5.3 CLIFF AND BANK

Cliff and bank habitats are very steep to vertical faces of bedrock outcroppings and occur inland, as well as along the coast.

Plate H5.3.1: Basalt cliffs at Cape Split, Kings County (District 720). Headland vegetation includes a coastal spruce forest (H6.2), and the cliff itself is habitat to arctic-alpine species, such as *Sedum rosea*, and to several species of lichen. Photo: A. Wilson.

FORMATION

Cliff and bank habitats have three probable origins: geological faulting and folding, rejuvenation of rivers associated with earlier lower sea levels and coastal erosion associated with modern rising sea level. The result is an elevated bare precipitous mass of rock outcropping.

PHYSICAL ASPECTS

1. *Bedrock:* variable.
2. *Soils:* bedrock outcrops with crevices filled with soil.
3. *Relief:* steep hilly or mountainous topography.
4. *Drainage:* north-facing cliff generally moist to dripping wet, while south-facing cliff tends to be dry. Conditions occurring on east- and west-facing cliffs dependent on local climatic conditions.
5. *Salt spray:* on sea cliffs in exposed situations.

ECOSYSTEM

This bare habitat is probably one of the most severe types to be colonized by plants. For a long time, only crustose lichens will persist, with herbs and very few tree species eventually colonizing the crevices. Generally speaking, these cliffs are too rocky and steep to support a forest stand.

SUCCESSIONAL SEQUENCE

As best as can be determined, the lichen–bryophyte–fern community constitutes the climax vegetation on the cliff habitat. The nature of the habitat would have to be radically altered through geological processes in order to produce a more elaborate successional sequence than the present plant community.

PLANTS

There are varying gradations between hydric (wet) and xeric (dry) cliffs, and a typical assemblage of plants associated with both extremes. This common community is comprised of the bryophytes and lichens, which thrive in crevices and frequently blanket even precipitous rock surfaces. The crustose lichens include *Lecanora* spp., *Lecidia* spp., *Buellia* spp. and *Rhizocarpon* spp.

Foliose lichens, such as *Parmelia* spp. and *Gyrophora* spp., and fruticose lichens, such as *Cladonia* spp. and *Stereocaulon* spp., are usually present. Many mosses and liverworts are frequent in this habitat; for example, *Bartramia pomiformis*, *Hedwigia ciliata*, *Radula complanata*, *Porella platyphylloides*, *Plagiochila asplenioides* and *Plagiopus oederiana*. Certain ferns are also characteristic: Rock Polypody, Common Bladder Fern and Rusty Woodsia. Fir Clubmoss is also typical of this habitat. Hair-grass and Harebell are frequent herbaceous species. This habitat may also harbour many of the rarer arctic-alpine plants.

ANIMALS

The lack of soil in rock crevices tends to limit and specialize the invertebrate fauna. The following may be found: Collembola (springtails), Bagworm Moths whose larvae feed on lichens, and predatory beetles which eat small insects. Some hardy species, such as the slug *Deroceras laeve*, may occur as incidentals.

The most conspicuous species on sea cliffs are seabirds, and this habitat is important for nesting of gulls, alcids and cormorants. Bank Swallows nest in cliffs of unconsolidated material.

SPECIAL FEATURES

- Lichens and bryophytes have several significant ecological adaptations which permit them to be the first colonizers of rock surfaces. Not only can these nonvascular plants exist without soil as a growing medium but they can also tolerate desiccation for an extended period to the point of becoming brittle.
- Lichens have the unique distinction of being able to disintegrate rock surfaces chemically by secreting corrosive carbonic acid.
- Arctic-alpine vegetation.
- A special kind of cliff in Nova Scotia is the unconsolidated bank found on seaward-facing, eroding drumlins. Bank Swallows and Kingfishers favour this habitat for nesting. This habitat is common along the coast of the Minas Basin (Region 700).
- Quarry sites have cliffs which, given the right conditions (e.g., the right substrate and available species), can function as a natural cliff ecosystem. A gypsum quarrry could regenerate naturally, developing the same type of vegetation as a gypsum cliff. A quartzite quarry could be colonized in the same manner as any other bare rock with lichens. Artificial cliffs do not usually have crevices where humus can accumulate, and regeneration is

very slow. Another difference is that quarry sites are generally associated with ponds, while natural cliff habitats are associated with flowing fresh or salt water.

DISTRIBUTION IN NOVA SCOTIA

Coastal cliffs are found in sections of the Cobequid Mountains, Pictou–Antigonish highlands and Mabou highlands (District 310); the cliffs, often in basalt, of Region 700; the old hard rocks of District 210; and the soft sandstones of Regions 500 and 600. Inland cliffs are found in ravines, often on fault lines and near waterfalls, especially in District 220, and in Regions 300 and 700.

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Associated Topics

T2 Geology, T4.2 Post-glacial Colonization by Plants, T7.3 Coastal Landforms, T8.1 Freshwater Hydrology, T8.2 Freshwater Environments, T8.3 Freshwater Wetlands, T10.7 Pteridophytes (Ferns and their Allies), T10.8 Bryophytes (Mosses, Liverworts and Hornworts), T10.11 Lichens, T10.12 Rare and Endangered Plants, T11.7 Seabirds and Other Birds of Coastal Wetlands, T12.3 Geology and Resources

Associated Habitats

H1.1 Open Water, H3.1 Open-water Lotic (Rivers and Streams), H3.5 Water's Edge Lotic (Rivers and Streams), H3.6 Water's Edge Lentic (Lakes and Ponds), H5.4 Talus Slope, H5.5 Cave

Additional Reading

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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.
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H5.5 CAVE

Caves are openings in bedrock caused by solution or erosion by percolating water, flowing water, or wave action. To some extent, abandoned mine shafts and tunnels also function as cave habitat.

Plate H5.5.1: Hayes Cave, South Maitland, Hants County (sub-Unit 511a). The water levels in the pools vary with rainfall. Photo: R. Merrick

FORMATION

Carbonic acid in solution in rainwater dissolves calcareous rocks, and over long periods of time, percolating water will cause the formation of cavities along paths of weakness in the rock. As these cavities increase in size, the erosional effect of flowing water becomes more important, and eventually a cave will be formed. Sinkholes at the surface above the cave are part of the system and, with streams, are the main routes by which water, soil and organic material enter the cave (Figure H5.5.1).[1]

Shallow caves in sea cliffs, caused by marine erosion alone, are never deep enough in Nova Scotia to provide a true cave habitat.

PHYSICAL ASPECTS

1. *Bedrock:* usually a calcareous sedimentary rock, particularly gypsum or limestone.
2. *Soils:* mixed clay and rubble, with variable amounts of humus, stratified when deposited by water.
3. *Relief:* variable; rough due to roof falls.
4. *Drainage:* water percolating through the cave roof, often accumulating in pools during wet seasons.
5. *Environmental conditions:* water has high pH (7.8 at Hayes Cave in Unit 511); air has 100 per cent relative humidity and usually constant temperature, 5°C to 9°C.

ECOSYSTEM

Because little or no light enters, there is no primary production in the cave habitat. The consumer organisms that are found depend upon organic material flushed in by water or brought in by mammals such as bats and porcupines.

SUCCESSIONAL SEQUENCE

Small cavities that develop into passages and caves eventually open up to the land surface. This allows for entry of soil, organic material and animals. With further solution and erosion, the cave system will eventually collapse, and the habitat will be destroyed.

PLANTS

The lack of light prohibits the growth of green plants. Fungi are usually present on the soil and on decaying organic material (e.g., animal droppings).

ANIMALS

Soil animals enter the cave accidentally and may establish populations similar to those that exist outside of the cave system. So far, no distinct cave soil fauna has been detected in Nova Scotia. Beetles and springtails are common. Dragonfly nymphs have been observed in cave pools.

Fish are occasionally seen in pools. At Hayes Cave, the Threespine Stickleback and an unidentified species of dace (*Chrosomus* spp.) have been recorded. The dace are slightly different from those seen in other habitats and are presumed to be an accidental occurrence. They have lost their pigmentation, due to low light levels and water temperatures.

Mammals recorded include bats and porcupines. The porcupines may be common at times, and their droppings contribute organic matter to the ecosystem. Bats use caves for hibernation during the winter, taking advantage of the constant temperature and humidity conditions. At Hayes Cave, the Little Brown Bat is the most common, but Keen's Bat and Eastern Pipistrelle also occur. The bats are in the cave from

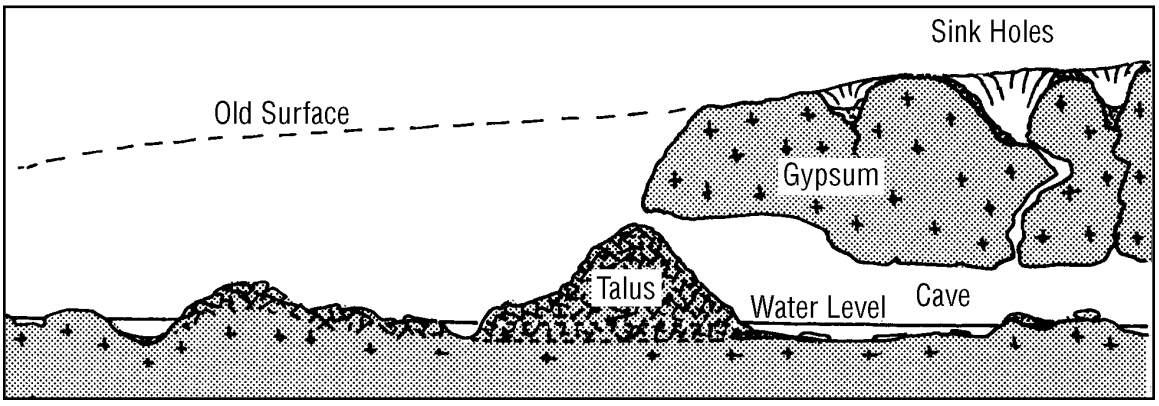

Figure H5.5.1: The main features of a cave system and karst topography in gypsum. Based upon information from South Maitland, Hants County (sub-Unit 511a). Not drawn to scale.

early September until the following June. Winter counts have indicated up to 6000 present throughout the winter.

SPECIAL FEATURES

- The karst topography of sinkholes and cliffs in gypsum areas that indicates the presence of caves (see Figure H5.5.2).
- The special environmental conditions: low light, alkaline water, high humidity and constant temperature.
- Hibernating bat populations. Survival of the bats depends upon maintenance of the correct environmental conditions and prevention of disturbance.

DISTRIBUTION IN NOVA SCOTIA

Caves may occur in any limestone or gypsum area. The best-known examples are in the gypsum formations of Hants County and Victoria County (Districts 510, 520, 540 and 560). It is believed that there are many other small cave systems, particularly in Cape Breton Island. Abandoned mine workings in Cape Breton (Districts 540 and 550) and in the gold districts of the Meguma Group (Districts 410, 420 and 430) can also provide cave habitats, especially for hibernating bats.

Associated Topics

T2.4 The Carboniferous Basin, 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, T10.10 Fungi, T11.8 Land Mammals, T11.11 Small Mammals, T12.3 Geology and Resources

Associated Habitats

H3.6 Water's Edge Lentic (Lakes and Ponds), H5.3 Cliff and Bank

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Additional Reading

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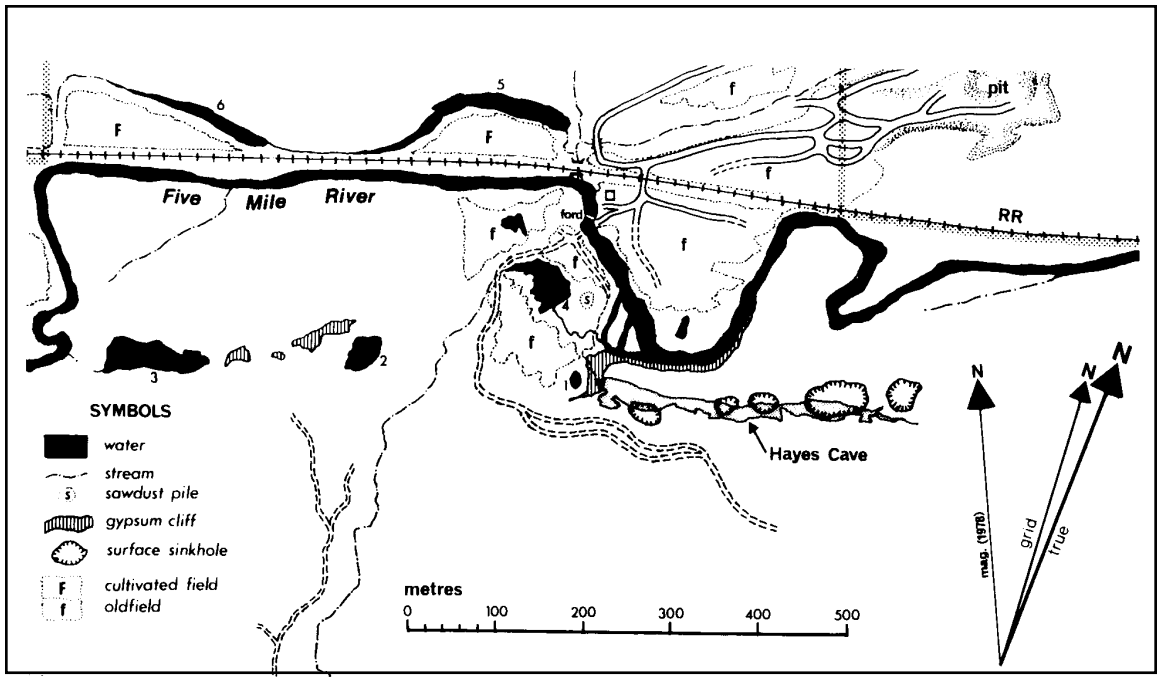

Figure H5.5.2: The location of the cave system at South Maitland, showing the relationship between the cave and karst topography.

