



## Southern Algific Talus

Cool, moist, open plant communities on steep northwest- to northeast-facing bluffs in karst landscapes of southeastern Minnesota. Characterized by cold, wet microclimate maintained by cold air and groundwater emanating from subterranean ice. Community supports northern plants uncommon in southern Minnesota and Pleistocene land snails.

### Vegetation Structure & Composition

Description is based on summary of data from vegetation plots (relevés), plant species lists, and field notes from 55 algific talus communities.

- Lichen and bryophyte** cover is generally patchy to interrupted (25–75%). Mosses and liverworts are abundant on exposed rock and moist soil, often forming thick carpets, especially near cold air vents. Lichens are present on exposed rock, especially in drier areas. Rare bryophyte species may be present as very small clones, including the mosses *Grimmia retinervis*, *Mnium marginatum*, *Myurella sibirica*, *Plagiopus oederiana*, *Platydictya* spp., *Pseudoleskeella tectorum*, *Seligeria calcarea*, and *S. pusilla*. More common bryophyte species such as the liverwort *Conocephalum conicum*, and the mosses *Gymnostomum aeruginosum*, *Plagiomnium cuspidatum*, *Thuidium delicatulum*, and the ubiquitous *Brachythecium acuminatum* may form abundant cover on boulders or rock edges near cold-air vents.

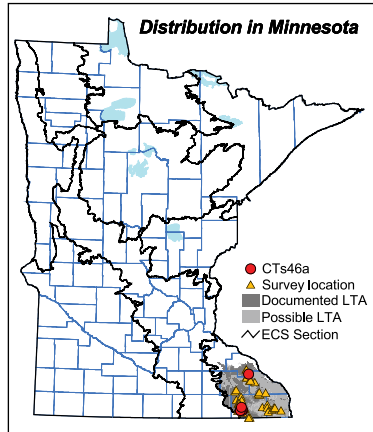
- Herbaceous plant** cover is variable, generally sparse (5–25%) in spring but often becoming interrupted to continuous (50–100%) in summer. Characteristic species include moschatel (*Adoxa moschatellina*), swamp saxifrage (*Saxifraga pennsylvanica*), bulblet fern (*Cystopteris bulbifera*), northern oak fern (*Gymnocarpium robertianum*), naked mitwort (*Mitella nuda*), touch-me-nots (*Impatiens pallida* and *I. capensis*), wood nettle (*Laportea canadensis*), stinging nettle (*Urtica dioica*), hairy rock cress (*Arabis hirsuta*), panicked bluebells (*Mertensia paniculata*), twinflower (*Linnaea borealis*), and on bedrock outcrops, slender cliff brake (*Cryptogramma stelleri*). The rare species Iowa golden saxifrage (*Chrysosplenium iowense*) is restricted in Minnesota to this community. Herbaceous plants common in Southern Mesic Hardwood Forest (MHs) communities, such as Dutchman's breeches (*Dicentra cucullaria*), false rue anemone (*Enemion biternatum*), and nodding wild onion (*Allium cernuum*), are also often present.

- Shrub** cover varies from sparse to interrupted (5–75%). Typical species include Canada yew (*Taxus canadensis*), mountain maple (*Acer spicatum*), red-berried elder (*Sambucus racemosa*), highbush cranberry (*Viburnum trilobum*), dwarf alder (*Rhamnus alnifolia*), northern black currant (*Ribes hudsonianum*), and red raspberry (*Rubus idaeus*).

- Tree** cover is mostly sparse (5–25%); trees are generally rooted outside the coldest zones in the community. White pine, yellow birch, and balsam fir are often present along with species common in MHs communities, such as sugar maple and basswood.

### Landscape Setting & Soils

- Steep stream-dissected bedrock bluffs**—Rare. Present in dissected bedrock terrain where little of the original plateau remains as interfluvies between stream valleys. Most common on steep slopes with north-facing aspects, typically in middle and upper portions of small to medium stream valleys. Rock types include limestone and dolomite. Substrate is colluvial in origin with organic silty soils mixed among rock fragments of various sizes. Small bedrock outcrops are common. Cliffs or outcrops are often present upslope. (Blufflands in PPL)





## Natural History

Southern algalic talus communities are rare, with worldwide distribution limited to the Paleozoic Plateau of Minnesota, Wisconsin, Iowa, and Illinois. They occur in specialized settings on steep slopes in deep, narrow, often tightly meandering forested valleys. The cold air and groundwater that create the cold microclimate are produced and maintained by a unique system involving ridgetop sinkholes and subterranean ice caves; this system also supports Maderate Cliffs (CTs43). Many algalic slopes have cold microclimates throughout the summer, even on the warmest days. On the coldest talus slopes, ice may be present until midsummer beneath moss mats. The deep valleys where the community occurs are generally cooler and moister than the surrounding landscape, especially in areas with intact forest canopies, and algalic talus slopes are rarely affected by direct sunlight. Cool air settles in these valleys in the evening, further enhancing their cool microclimate and minimizing desiccation. Groundwater seepage flow is generally diffuse and concentrated around cold vents. Dense, thick mats of mosses and liverworts form around the vents. In general, the coldest and most extensive algalic slopes occur in limestone formations, especially the Galena group; algalic slopes on dolomite formations are typically not as cold and tend to have fewer northern plants.

## Similar Native Plant Community Classes

### ● MHC38 Central Mesic Cold-Slope Hardwood-Conifer Forest

MHC38 often borders occurrences of CTs46 and is likely influenced by the algalic systems that support CTs46; MHC38, however, lacks cold air vents immediately within the community itself and has a patchy to interrupted tree canopy. CTs46 is distinguished by the presence of cold air vents and generally lacks a tree canopy, with shading predominantly from trees on the margins of the community.

### ● CTs43 Southern Maderate Cliff

CTs43 and CTs46 both support northern species, are cooled by subterranean ice systems, and may be present in close proximity. CTs43 occurs on vertical bedrock substrates at least 10ft (3m) tall and generally much taller. CTs43 is more likely to have fragile fern (*Cystopteris fragilis*) and the rare species Arabian whittow grass (*Draba arabisans*) and Leedy's roseroot (*Sedum rosea* var. *integrifolium*). CTs46 also occurs on steep bluff slopes but is characterized by a substrate of moist, rich silt and talus blocks, with occasional moist bedrock outcrops. CTs46 is more likely to have naked miterwort, moschatel, Iowa golden saxifrage, nodding wild onion, swamp saxifrage, touch-menots, stinging nettle, northern oak fern, dwarf alder, and northern black currant.

### ● CTs23 Southern Open Talus

CTs23 occurs on steep slopes in settings similar to CTs46, and mesic occurrences of CTs23 (CTs23b) share some species with CTs46. CTs23, however, lacks the cold microclimate characteristic of CTs46. As a result, northern plant species such as naked miterwort, moschatel, Iowa golden saxifrage, panicled bluebells, northern oak fern, alpine enchanter's nightshade (*Circaea alpina*), dwarf alder, and northern black currant, and remnant populations of Pleistocene land snails are absent from CTs23.

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## Native Plant Community Types in Class

Plant species composition has not been systematically sampled or analyzed across the range of CTs43, and only one community type is recognized in the class at present.

### ● CTs46a Algalic Talus

Moist to wet limestone or dolomite talus communities with cold microclimate. CTs46a is divided into two subtypes based on type of bedrock, which appears to influence degree of coldness and species composition. In general, limestone formations are colder than dolomite formations because they are more extensively fractured and dissolved and therefore have capacity to store larger quantities of subterranean ice.

- CTs46a1 Limestone Subtype

- CTs46a2 Dolomite Subtype



photo by S.C. Zager MN DNR



Fillmore County, MN