

## Caves

### Definition

These are naturally occurring underground cavities that are large enough to have a different environment (temperature, humidity, etc.) than conditions outside the cave.

### Ecological Function

Caves provide a very consistent environment of temperature, relative humidity, and air flow. Changes in structure and hydrology could greatly affect the habitat provided by subterranean areas. Bats are one of the better studied orders of wildlife species associated with subterranean areas and have been surveyed in caves going back into the 1930s. There are 6 species of bats known to hibernate in Vermont caves. Recent surveys indicate that caves may hold as few as less than 10 bats to as many as over 70,000. Bats use these sites for hibernation, but also spend a disproportionate amount of the year in the surrounding area (e.g., fall swarming).

Interest and understanding in the invertebrate community associated with caves is just beginning. Little is known about the condition of the subterranean aquatic habitats. At the national and global scale, it is well-documented that caves provide habitat for specialized invertebrates (Peck 1998). Caves are expected to function as a coarse filter for these species which are poorly understood.

### Priority Target for an Ecologically Functional Landscape

Fifty percent of known caves in Champlain Valley (CV) and Taconic Mountains/Vermont Valley (TM/VV), and all caves in all other biophysical regions, are targeted to maintain an ecologically functional landscape.

Currently, there is insufficient inventory of caves to identify specific numerical targets to achieve 50% representation of caves in the CV and TM/VV regions, and even less information to fully assess representation of bedrock and formation of targeted caves. Additional study is needed to refine these targets. In lieu of a numerical target, the highest priority list of caves below (next page) represents our current best knowledge of the caves most critical for ecological function and maintaining an ecologically functional landscape.

*Highest Priority:* All targeted caves. At this time, the following list of caves:

Cave	Biophysical Region
1867 Cave	TM/VV
Aeolus Cave	TM/VV
Barrel Cave	CV
Bear Bones Cave	TM/VV
Bristol Cave	CV
Calvin Cave	TM/VV
Carbide Cave	Other BPR
Chimney Cave	TM/VV
Easter Cave	Other BPR

Kent (Wyman's) Cave	TM/VV
Little Skinner Hollow	TM/VV

Cave	Biophysical Region
Milton Cave	CV
Morris Cave	TM/VV
Nickwackett Cave	CV
Philadelphia Cave	CV
Plymouth Cave	Other BPR
Porcupine Caves	CV
Quarry Cave	TM/VV
Skinner Hollow Cave	TM/VV
Trap Spring Cave	CV
Vermonster Cave	TM/VV
Williams Cave	TM/VV

## Guidelines for Maintaining Ecological Function

Subterranean areas should remain intact, with limited human alteration or influence from above-ground pollutants. Maintain natural processes, including temperature regime, airflow, humidity, and hydrology; natural vegetation conditions above the cave footprint and a 50m buffer to moderate air and temperature conditions; and natural groundwater sources. Recreational exploration of caves can pose a threat to physical conditions and cave species. Within a 0.25-mile zone around the cave entrance, maintain or restore a closed forest canopy with native species and abundant potential live or dead roost trees with cavities, cracks, crevices, and/or peeling bark.

## Restoration Needs

For some caves, restoration of natural vegetation around cave entrances and the cave footprint is needed to achieve full ecological function.

## Mapping Comments

Cave locations are not mapped or described to protect sensitive species from disturbance. Locations of caves are provided to landowners and may be available upon request for conservation purposes.

## Methods and Rationale

Cave targets were selected in an effort to represent all cave types (e.g. solutional, non-solutional) and bedrock types across all biophysical regions. Unfortunately, there is no classification or comprehensive inventory of caves in Vermont. Specific cave targets were selected because they are known sites with documented use by bats and/or invertebrates.

## Abandoned Mines

### Definition

Abandoned mines that provide suitable habitat used by hibernating bats, and the mines' surrounding naturally vegetated zone necessary for full ecological function. These targeted abandoned mines are large enough to have a different environment (temperature, humidity, etc.) than conditions outside the mine.

### Ecological Function

Abandoned mines may provide many or all of the habitat qualities of natural caves and can even provide better habitat in some instances. These human-created cultural habitats are found statewide due to the history of Vermont. Although not of natural origin, they augment the natural habitats available to wildlife. In particular, bats are known to use some mine sites as hibernacula, and some mines support large bat populations. It is also possible that mines also support subterranean invertebrates, but this needs additional study.

### Priority Target for an Ecologically Functional Landscape

All abandoned mines used (or formerly used, prior to white-nose syndrome) as bat hibernacula are targeted. At present, 19 known abandoned mines are targeted.

*Highest Priority:* All abandoned mines used (or formerly used, prior to white-nose syndrome) as bat hibernacula. Currently, 19 abandoned mines:

Cave	Biophysical Region
Brandon Silver Mine	SGM
Bridgewater Mine #1	SGM
Bridgewater Mine #2	SGM
Camp Brook Mine	NGM
Clifton Adit Mine	SGM
Dover Iron Mine	SGM
Elizabeth Mine	SVP
Ely Copper Mine	NVP
Fox Gold Mine (Rook's)	SGM
Greely 2 Mine	NGM

Cave	Biophysical Region
Greely Talc Mine	NGM
Hammondsville Mine	SGM
Johnson Talc Mine	NGM
Luzenac Mine - Frostbite	SGM
Luzenac Mine - Yager	SGM
Moretown (Eastern Magnesia) Talc Mine	NGM
Pike Hill Mine	NVP

Rochester Iron Mine	NGM
Rousseau Talc Mine	NGM

## Guidelines for Maintaining Ecological Function

Subterranean areas should remain intact, with limited human alteration or influence from above-ground pollutants. Maintain natural processes, including temperature regime, airflow, humidity, and hydrology; natural vegetation conditions above the mine footprint and a 50m buffer to moderate air and temperature conditions; and natural groundwater sources. Recreational exploration of mines can pose a threat to physical conditions and mine species. Within a 0.25-mile zone around the mine entrance, maintain or restore a closed forest canopy with native species and abundant potential live or dead roost trees with cavities, cracks, crevices, and/or peeling bark.

## Restoration Needs

There may be opportunities to restore natural vegetation around mine entrances and the mine footprint.

## Mapping Comments

Abandoned mine locations are not mapped or described to protect sensitive species from disturbance. Locations of abandoned mines may be available upon request for conservation purposes.

## Methods and Rationale

Abandoned mines provide unique habitat conditions. Those known to be used as bat hibernacula make important contributions to Vermont's ecologically functional landscape.

## For more information

For more information specific to this component, contact Vermont Fish & Wildlife Department, Jens Hilke, at 802-461-6791, [jens.hilke@vermont.gov](mailto:jens.hilke@vermont.gov) and Bob Zaino, at 802-476-0128, [Robert.Zaino@vermont.gov](mailto:Robert.Zaino@vermont.gov)