

Hedgehog Mountain Management Plan



Town of Freeport Conservation Commission
First Edition Approved September 7, 2004
Current Revision Submitted December 13, 2022

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Purpose of the Plan

The Conservation Commission is charged with managing and maintaining the Hedgehog Mountain property, consistent with the Hedgehog Mountain Management Plan (Section 35-8). The Commission shall review the Hedgehog Mountain plan at least every five years and recommend changes necessary for the proper management and operation of the Hedgehog Mountain Property (Section 35-8). The first management plan was approved by the Conservation Commission and submitted to the Freeport Town Council for a public hearing and amendments or approval. It was approved by the Town Council on September 7, 2004. This current revision of the plan was submitted to the Conservation Commission and received approval on December 13, 2022.

The Hedgehog Mountain Management Plan includes background information, a description of the natural and cultural resources, rules for the property, and future management actions.

Property Overview

In 1989 the voters of Freeport approved by referendum the purchase of the 100-acre Hedgehog Mountain or Soule property, located off of Pownal Road and adjacent to the Freeport Recycling Center. The acquisition was funded by corporate and individual donations, and funds from the Freeport Land Bank Commission (now known as the Conservation Commission).

In February 1992, the Freeport Town Council established the Hedgehog Mountain Planning Committee to develop and prioritize land use options, which led to the original management plan. The committee conducted field surveys and interviews with the Freeport Historical Society, Bradbury Mountain State Park, the Maine Forest Service, the Winslow Park Commission, as well as townspeople who had special knowledge or interest in the property.

In 2001 the town expanded Hedgehog Mountain by acquiring an additional 96 acres of property owned by Scott and Margaret Keith abutting the original tract to the south towards Hunter Road. The acquisition was made possible through funding from Freeport's Open Space Bond Fund, Hedgehog Mountain Fund, L.L. Bean, Inc., and the Davis Conservation Foundation.

Hedgehog Mountain is a significant natural resource belonging to the Town of Freeport. Less than a mile from downtown Freeport, it features the town's highest point of land (elevation 308 feet), almost 200 acres of woodlands, and over five miles of trails enjoyed year-round by walkers, mountain bikers, hunters, and snowmobilers. The Conservation Commission maintains the property as a natural resource where Freeport residents and visitors are able to experience nature in quiet solitude. This plan has been developed with respect to the ecology of the site, public input, the Conservation Commission ordinance, and the Open Space and Public Access Plan.

Location of the Site

The 196-acre Hedgehog Mountain lies approximately 4000 feet west of Interstate 295 within the upper watershed of Merrill Brook. The northern boundary is approximately 300 feet south of Pownal Road. The southern boundary runs approximately 600 feet north of and parallel to the Hunter Road.

This area of Freeport is separated from the coast by Interstate 295 and the commercial U.S. Route 1 corridor. It is zoned Rural Residential and includes residential development, agricultural lands, small businesses, Pine Tree Academy, the abutting Freeport transfer station, and the recreational Hunter Fields.

The property is accessed from Hedgehog Mountain Road. A gravel parking area located before the recycling center gate can accommodate approximately 4 vehicles. Vehicles frequently park along the adjacent shoulder of the road when the parking area is at full capacity, which occurs on a regular basis. The town currently has no deeded access from the south. This is addressed in the management section of this plan.

Two unimproved woods roads, known as Reed Road and Soule Road, bisect part of the property. Other than the Soule Road, there are no known rights-of-way on the property. Prior to the purchase of the Soule and Keith properties, boundary surveys were conducted for the town by Owen-Haskell, Inc.

Current and Historic Uses

Prior to its purchase by the Town of Freeport, the property was in the ownership of the Soule and Keith families, and the land was historically used for its pastures and forest resources. Children frequented the area, exploring the summit and building small forts and shelters in the summit area. Many people viewed the 1932 eclipse from the Hedgehog summit.

Many of the current trails, originally skid roads, are now used by hikers, horseback riders, mountain bikers, hunters, snowmobilers, and cross-country skiers. The most popular trail is the Summit Trail, which provides views of Mount Washington on a clear day. Over the years, the trails have been used by recreational vehicles—primarily snowmobiles and all-terrain vehicles (ATVs), which led to heavy erosion of many of the trails. This is addressed in the management section of this plan.

Natural and Cultural Resources

Below is a summary of Hedgehog Mountain resources. The Conservation Commission will continue to conduct inventories of the natural and cultural features of this site to reflect the current conditions of the property.

Soils

Based upon data provided by Natural Resources Conservation Science, the soils on the original tract of the Hedgehog Mountain property consist of Hollis, Buxton, Belgrade and Suffield soils. See the attached “Highly Erodible Soils in Cumberland County and Parts of Oxford County, Maine” for information about the erodible soils found on the property and detailed below.

Hollis soils cover approximately 30% of the site, primarily on the higher elevations of Hedgehog Mountain between elevation of 180 and 308 feet. These soils are shallow, somewhat excessively drained, gently sloping to steep, and moderately coarse textured with several rock outcrops. These soils are considered highly erodible by the United States Department of Agriculture, with exposed bedrock near the summit of Hedgehog along the Summit Trail and thin soil cover elsewhere between 6 – 14 inches or less. See the attached “Highly Erodible Soils in Cumberland County and Parts of Oxford County, Maine”, for information about erosion and its impacts.

Buxton soils cover approximately 20% of the site and are moderately to somewhat poorly drained with depth to bedrock five feet or greater. These soils are sensitive to erosion, in part because of a seasonal high-water table and frost action.

Belgrade soils cover approximately 30% of the site and consist of deep, moderately drained nearly level medium textured soils. Depth to bedrock is 5 feet or greater. Wetness and seasonal high-water table are characteristic. These soils are found adjacent to the small streams in the southern end of the property.

Suffield soils cover approximately 10% of the property and consist of deep, well-drained, steep, medium-textured soils. Depth to bedrock is five feet or greater. Steep slopes exceed 25%. These soils are located along two small streams in the southernmost portion of the property.

Topography

The topography of the property spans nearly 300 feet in elevation between the summit and the deepest gullies. Contours vary from rolling hillside to steep-sided ravines. Hedgehog Mountain, the highest point of land at 308 feet, is located in the northern portion of the property and has slopes ranging from 8% on the northeast side to 60% on the southwest side. South of the mountain, slopes flatten and then again become steep in stream areas. For the purposes of this management plan and its associated management actions, the “summit area” is defined by the Conservation Commission as elevation that exceeds 180 feet, which is found only around the summit of Hedgehog Mountain. More information regarding the designation of the summit area can be found in the Soils section.

Hydrology

The property lies in the watershed of Merrill Brook, which drains into the Cousins River and Casco Bay. Headwater streams and tributaries etch the numerous gullies and ravines cutting through the property. The property also includes several forested wetlands that are fed primarily by groundwater discharge along hillsides and streamside slopes.

Forest and land cover

Prior to conservation by the Town of Freeport, Hedgehog Mountain had been managed for timber. No old growth occurs on the site, but several stands are mature and offer the plant diversity expected within the region. The tallest canopy cover on the property can be found within the summit area of the property, likely due to the steeper slopes making harvest challenging, and just south of the trail between the parking area and the Summit Trail. In general, the forest communities of the property are healthy, however numerous tree species found on the property are hosts for invasive pests that are becoming increasingly prevalent in Maine. More information can be found about this in the Management Threats and Challenges section. Cavity trees, poorly formed trees, and potentially diseased trees occur in normal densities and provide productive wildlife habitat. There is some evidence of beech bark disease, and some of the white pine has been weevilled, which are commonly seen in forests of midcoast Maine.

As detailed in a 1995 study conducted for the Conservation Commission by Woodlot Alternatives, Inc., the land supports several forest communities—hardwood, softwood, and mixed wood types—with a broad range of age, size, and species across the property. The diversity ranges from the dry, shallow-to-bedrock summit of Hedgehog Mountain to cool shaded hemlock slopes in the ravines, at the headwaters of Merrill Brook. Extensive hardwood slopes, facing primarily to the west and south, contain red oak, beech, sugar maple, white birch and white ash. Pure white pine stands lie at the heads of a network of deep, stream-cut ravines draining the tract to the south.

At present, there is a diversity of graminoids (grasses, rushes, and sedges) growing on the summit area slope of Hedgehog Mountain. Many are common mesic forest species, a habitat exemplified at Hedgehog. Broad loose-flowered sedge (*Carex laxiflorae*), which is an uncommon species of forested ledges in Maine, was observed on the summit area. The shrub Leatherwood (*Dirca palustris*) occurs throughout the summit area of Hedgehog Mountain and was surveyed in 2022. Leatherwood is an indicator of relatively rich (non-acidic) soil conditions and grows slowly. Leatherwood is currently considered common in Maine, however it was noted by a botanist who surveyed the summit area that there are few other places in the state where leatherwood has been observed forming such a frequent understory component. Back's Sedge (*Carex backii*) was identified near the summit trail in summer 2000 and has not been observed in recent years, however the area has not been regularly surveyed and continues to consist of habitat capable of supporting Back's Sedge. The property should be regularly surveyed to reflect the changing presence of plants as resources allow.

Wildlife

Over 89 bird species have been observed on the property and recorded by numerous observers via eBird, an online database providing real time data on bird population distribution and abundance. Many of the bird species that occur are migratory (i.e. neotropical migrants such as warblers, vireos, thrushes). Resident species include forest songbirds, raptors, and upland game birds. Trail development, most notably the creation of the Senior Project Trail, was noted by a local birder and longtime visitor of the property to have resulted in wood thrush no longer breeding on the property after understory habitat was cleared during trail construction.

Commonly occurring mammal species on the property include deer, moose, raccoon, porcupine, skunk, fisher, mink, gray squirrel, red squirrel, chipmunk, voles, moles, shrews, and bats. No formal surveys have been conducted to ascertain if bats are overwintering or breeding on the property, however it should be noted that bats are afforded special protections in Maine due to population decline as a result of a fungal disease called white-nose syndrome, which is responsible for the marked decline of several hibernating bat species in North America including the Little Brown Bat, which is currently listed as an endangered species. To date no formal surveys have been conducted to document reptile, amphibian, or invertebrates utilizing Hedgehog Mountain's diverse habitats.

According to data from Beginning with Habitat data provided by Maine Natural Areas Program and the Department of Inland Fisheries and Wildlife, no Significant Wildlife Habitats or Essential Wildlife Habitats as specifically defined by state law have been mapped on the property.

Cultural and historic features

Along the so-called Soule Road are the foundation remains of a house and sizeable barn, which existed until about 1930. Also present, near each of these remains, are two stone-lined wells. The well closest to the

house site remains in good condition, with its cover in good repair. Above the old house foundation, but below the summit, is a well-preserved historic stone wall.

Recreation

The property was intended to be used for low impact recreation to allow visitors and residents of Freeport to enjoy the property in its natural, open, undeveloped state. Trails were developed to be used for hiking, birding and nature observation, cross-country skiing, mountain biking on designated trails, horseback riding, snowmobiling on designated trails, and hunting. Commercial uses of the property are not permitted.

A number of trails cross the Hedgehog Mountain property and are outlined below. Some of these trails and footpaths were created after the property was purchased, while others were originally logging roads. Each trail is described below and notes what forms of recreation are allowed.

- **Hedgehog Trail** leads from the parking lot and connects to the Summit Trail, Soule Road, and the Stone Wall Trail. Hiking, mountain biking, horseback riding, and cross-country skiing are allowed on this trail.
- **Summit Trail** extends from the Bridge/Hedgehog Trail, over the summit, to Soule Road. Only hiking is allowed on this trail due to highly erodible and thin soils.
- **Wentworth Trail** is a short loop accessible from Soule Road. Wentworth Trail is named after Paul Wentworth for his active involvement in trail building. Hiking, mountain biking, horseback riding, and cross-country skiing are allowed on this trail.
- **Soule Road**, an abandoned road that runs north-south across the former Soule property, ends at Reed Road. Hiking, mountain biking, horseback riding, snowmobiling, and cross-country skiing are allowed on this trail.
- **Reed Road**, one of Freeport's abandoned range roads, runs from Hunter Road to the Freeport Transfer Station. The trail is not publicly accessible from either Hunter Road or the transfer station. Hiking, mountain biking, horseback riding, snowmobiling and cross-country skiing are allowed on this trail.
- **Several loop trails** extend through the former Keith property. Hiking, mountain biking, horseback riding, and cross-country skiing are allowed on these trails.

All trails are open to hiking, whereas mountain biking and horseback riding are not permitted on the Summit Trail or Stonewall Trail as they are located within the defined summit area that is sensitive to erosion and surface alterations. Snowmobiles are permitted on Soule Road and Reed Road, which are wide enough woods roads to safely accommodate multiuse but require the permission of abutting landowners to use.

Hunting

Hunting is an allowed use on the property, though current use on the property is unknown. The property is open to shotgun and bowhunting only and is located within the State of Maine Management Wildlife District 21. Hunters should know the locations of the property boundaries and trails and maintain a 100-foot buffer from the trails when hunting for visitor safety and visitors should be advised to wear blaze orange for visibility during hunting season.

According to Maine Department of Inland Fisheries and Wildlife (MDIFW), over 160,000 people currently hold hunting licenses in Maine. Hunting remains the most effective wildlife management tool available and is the mainstay of wildlife conservation within the country. Hunting provides a great amount of financial support for game and non-game wildlife habitat improvement and conservation projects thanks in part to the sale of hunting and fishing licenses as well as hunting and fishing equipment due to Pittman-Robertson and the Dingell-Johnson Acts. Regulated hunting efforts and permit allocations driven by data and science-based metrics keep wildlife populations at biologically sustainable levels while accounting for human health and social tolerances.

Land accessible to hunting is a crucial piece to the puzzle for wildlife population management and this is especially true for coastal and southern Maine. Firearms discharge ordinances, development, and posted land, have significantly reduced the amount of land open to hunting. The wildlife management districts of 21 and neighboring district 24 have routinely underachieved MDIFW's antlerless (doe) deer harvest objectives due largely in part to inaccessible or non-hunttable land. Some of the highest densities of people and white-tailed deer reside in these areas of the state, continued hunting efforts and land access is vital to ensuring that biological and social wildlife population goals are met.

Management of Hedgehog Mountain

Oversight

The Freeport Conservation Commission ordinance (Section 35-8) assigns the Conservation Commission responsibility for the ongoing administration of Hedgehog Mountain, including monitoring uses of the area, overseeing maintenance, and other tasks. Through periodic updates of the Hedgehog Mountain Plan, the Conservation Commission will recommend to the Town Council administrative policies including, but not limited to land use, rules for the public use of the property, use of dedicated funds remaining from the purchase of the property, and annual budgets.

Budget

A Hedgehog Mountain Account dedicated to the property was established when the original parcel was purchased. In 2000 and 2001, the account contributed towards acquisition of the Keith property. This account funds administration and annual maintenance expenses for Hedgehog Mountain and is separate from the annual operating budget of the Conservation Commission. Funds available are limited in amount to the annual income generated by the account, as prescribed in the Conservation Commission ordinance Section 35-8.

It is an ongoing priority of the Conservation Commission to identify and pursue outside sources of funding for ongoing maintenance, site improvements, and future expansions.

Management Threats and Challenges

Hedgehog Mountain faces potential management threats and challenges in the form of limited capacity of volunteer labor to maintain the 5-mile trail system, the increasing presence of invasives plants, pests, and pathogens in Maine, and the impacts of climate change. Increasing development both regionally and locally has only increased the need for conserved open spaces like Hedgehog Mountain for recreation, wildlife habitat, and riparian buffers to streams and waterways. Since 2010 the population of Freeport has increased by 11.2% from 7,879 to 8,767 with increased housing developments being created on nearby Desert Road, leading to the potential for increased usage of trails and the likelihood of increased compaction and erosion. According to the 2011 Comprehensive Plan, "Conservation Commissions are all volunteers with no staff. The Commission has developed trail maps and stewardship plans for both Hedgehog Mountain and Florida Lake. As the number of town owned open spaces grows, it is difficult to keep up with stewardship with no staff. The town should be planning for long term stewardship of these open spaces." The Plan also states that while "acquiring more land for conservation purposes is important, it is also urgent to develop plans to take care of and use the land that is currently protected."

The onset of climate change has brought warmer temperatures to Maine and with it many other consequences. Spring now arrives earlier and is wetter, summers are hotter and drier, and damaging storm events are becoming more frequent. Over time these changes will upset the function and balance of Maine's ecosystems as the climate becomes less stable due to human and other factors. At Hedgehog Mountain, this instability may lead to more intensive erosion of the summit area due to increased storm events, more intense invasive plant and pest infestations, and increased plant and animal mortality during drier and hotter summers.

A number of tree species found on the property are experiencing or likely to experience mortality due to invasive pests entering the state. Hemlock Woolly Adelgid, an aphid-like invasive insect originating in Asia that attacks eastern hemlock trees, is widespread in many parts of the state and according the Maine Department of Agriculture, Conservation, and Forestry (MDACF), was first detected in Freeport in 2010 and is likely present on the property. Red Oak and White Ash are also located on the property, which are hosts for other invasive pests including Browntail Moth and Emerald Ash Borer. Browntail Moth has been well documented and distributed in the Town of Freeport in recent years and Emerald Ash Borer was detected in neighboring towns of Yarmouth and Pownal in 2022 by MDACF. The Town of Freeport is currently within the MDACF Quarantine Area for Emerald Ash Borer with anticipated fatality of Ash trees in coming years. The spread of invasive plants and pests have the potential to negatively impact the conservation values of the Hedgehog Mountain through tree mortality, leading to loss of wildlife habitat and increased potential erosion, particularly on the summit area where soils are already thin. The proximity to the transfer station, where residents bring organic yard waste and wood, poses a potential threat as a vector of invasive plants and pests being inadvertently spread.

The best method to combat these management challenges is to regularly review and adapt management strategies in the face of climate change, however the long stretches of undisturbed wooded slopes at Hedgehog demonstrate how it's topography, even on a small scale, can affect vegetative patterns and provide space for plant migration over time.

Landform diversity is key in providing the "stage" for biodiversity and protecting these places in perpetuity on public conserved land such as Hedgehog Mountain can only be beneficial in the long run as Cumberland County continues to grow in population and plants and wildlife adapt to climate change.

Management Goals

Hedgehog Mountain represents a unique public land holding and significant natural resource in Freeport. Its 196 acres contain diverse topography, forest types, and plant and animal habitats. The centerpiece of the property is the summit of Hedgehog Mountain. At 308 feet above sea level, it represents the highest point in Freeport, and is one of the last undeveloped high grounds. The summit offers expansive views towards the White Mountains and foothills in the west.

The Conservation Commission maintains the property as a natural resource where Freeport residents and visitors are able to experience nature in quiet solitude. The management of Hedgehog Mountain is supported by the objectives of the Open Space and Public Access Plan "to protect special resource values and functions, provide trails and natural areas for public enjoyment, conserve scenic views and landscapes, and to create a pleasing and vital open space system" (1999 Freeport Open Space Plan, p. 1). The Open Space and Public Access Plan was accepted by the Town Council in 1999 as part of Freeport's Comprehensive Plan.

The Plan sets goals to be accomplished by 2009, and it was noted in the 2011 Comprehensive Plan that the goals of that Plan continue to be relevant and desirable today and provide guidance and goals for the preservation of open space. The vision of the 2011 Plan included "protecting natural and historic resources, maintaining large tracts of undeveloped fields and forests and providing opportunities to enjoy these places, protecting environmentally sensitive areas, and continuing to improve air and water quality" (p. 3-4).

The Hedgehog Mountain plan has been developed in accordance with the Conservation Commission ordinance, which states that the Commission may manage its land "in a manner which allows public use and enjoyment consistent with the natural, historic and scenic resources of the land" (Section 35-3). The ordinance prohibits "activities detrimental to drainage, flood control, water conservation, erosion control or soil conservation, or other acts or uses detrimental to the cultural, natural, scenic or open condition of the land or water areas" and requires that the Commission keep its property "predominantly in its natural, scenic or open condition" (Section 35-5).

Thus, the activities allowed at the property should have little or no impact on soils, water and air quality, noise levels, vegetation, and wildlife. Due to the erosive nature of the soils, activities including mountain biking, horseback riding, and snowmobiling are not permitted on the summit area or the Summit Trail and Stonewall Trail. The Conservation Commission will work with local mountain biking clubs on improving multiuse trails on the property that are designated for mountain biking and hiking as resources allow. All-terrain vehicles (ATVs) are not permitted anywhere on the property.

Rules

The following rules will apply to Hedgehog Mountain:

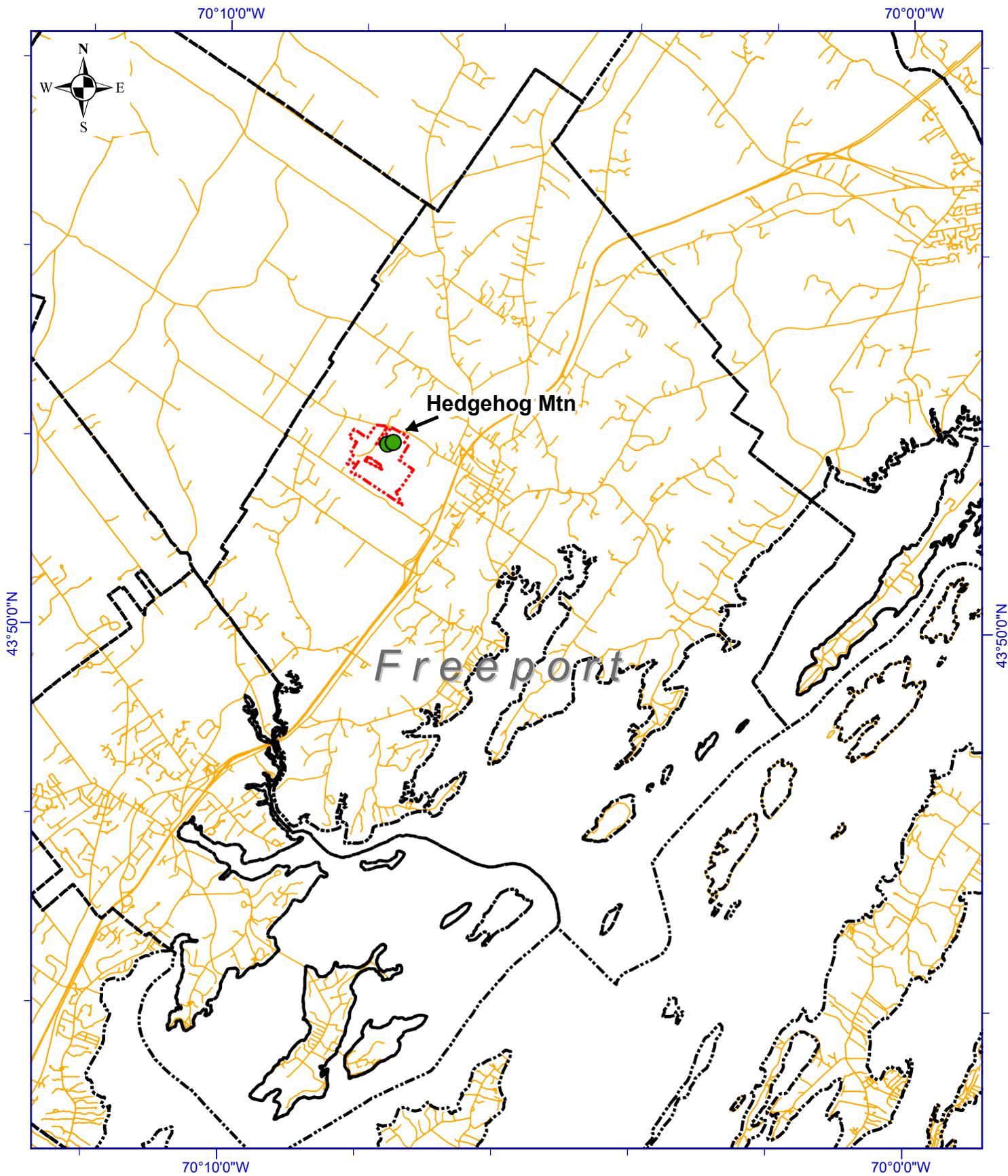
1. The property is for day use only.
2. Hiking, cross-country skiing, snowshoeing, hunting for shotgun and bow hunters only, fishing, horseback riding, and wildlife observation are allowed.
3. The property will be open from a half-hour before sunrise to a half-hour after sunset.
4. Camping and fires are not allowed.
5. All garbage must be carried out from the property.
6. Alcoholic beverages are not allowed.
7. Motorized vehicles are prohibited, except snowmobiles on designated trails in winter, and vehicles used for approved maintenance and in the event of search and rescue.

8. Mountain bikes and horses are allowed on designated trails and are prohibited from the summit area.
9. Dogs are allowed but must be on leash or under voice control.
10. Hunting is allowed for shotgun and bow hunting only. Hunters should stay 100 feet from trails when hunting and obey all local and state laws.

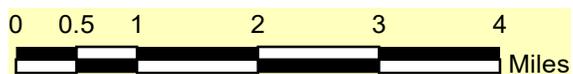
Management actions

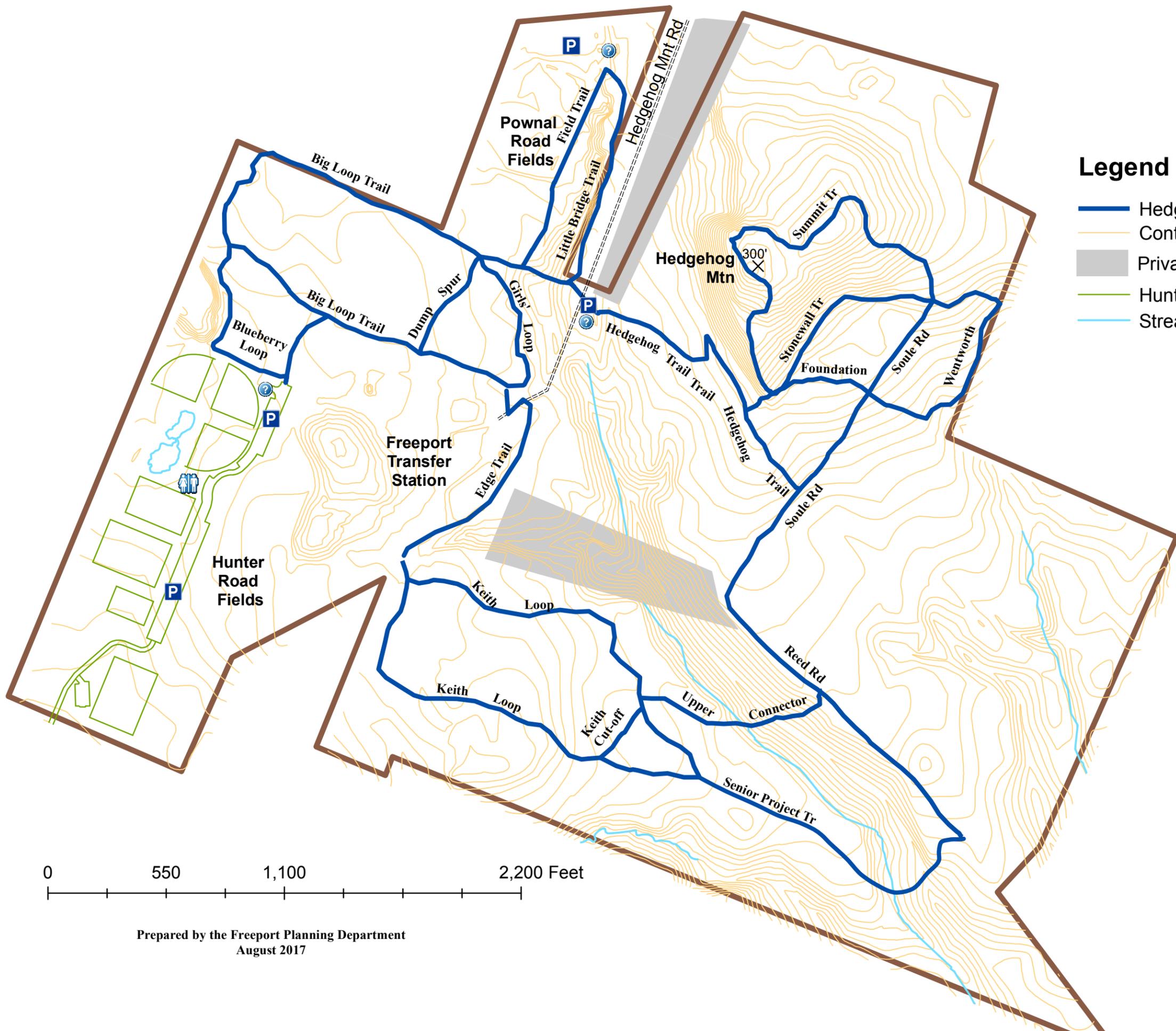
The following actions will govern the future management of Hedgehog Mountain:

1. Establish a comprehensive signage system, including trail signage, boundary markers, features of interest, and information on hunting safety, and park rules.
2. Maintain trails for safe use and to correct and minimize erosion potential.
3. Maintain the natural character of the summit and the views that it affords.
4. Preserve the ecologic, historic, and archaeological features of the property.
5. Enhance wildlife habitat and forest health through sustainable forestry practices.
6. Encourage pet walkers to carry out waste.
7. Investigate options for acquiring adjacent lands and those necessary for possible connections to other public open spaces.
8. Pursue obtaining access to Hedgehog Mountain from Hunter Road and parking for 4-6 cars.
9. Engage local citizens and identify a core group of volunteers to help maintain trails, act as stewards, and guide nature walks.
10. Monitor the site regularly for the presence of invasive species and implement control techniques when necessary.
11. Encourage hunters to use safe hunting practices. Urge visitors to be aware of hunters and to wear blaze orange during hunting season.
12. Encourage users to respect property boundaries.



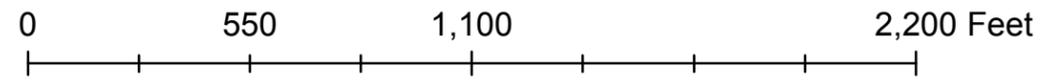
Location of Hedgehog Mountain
Hedgehog Mtn, Freeport, ME
Grid is Geographic NAD83
RGG April 10, 2022



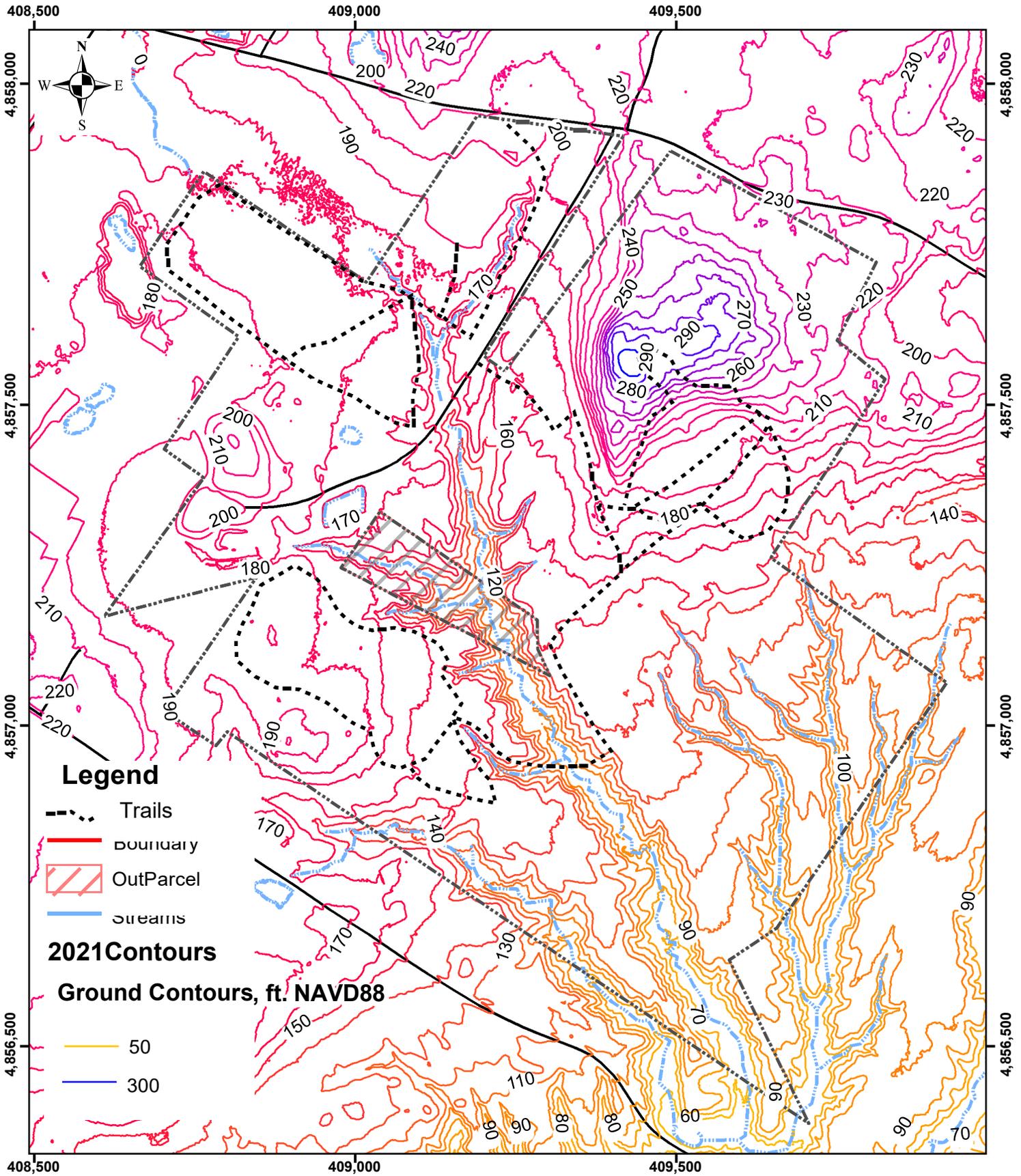


Legend

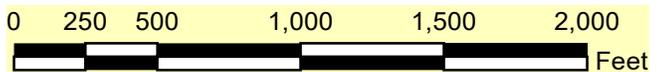
- Hedgehog trail system
- Contours at 5' intervals
- Private Property
- Hunter Rd fields
- Stream

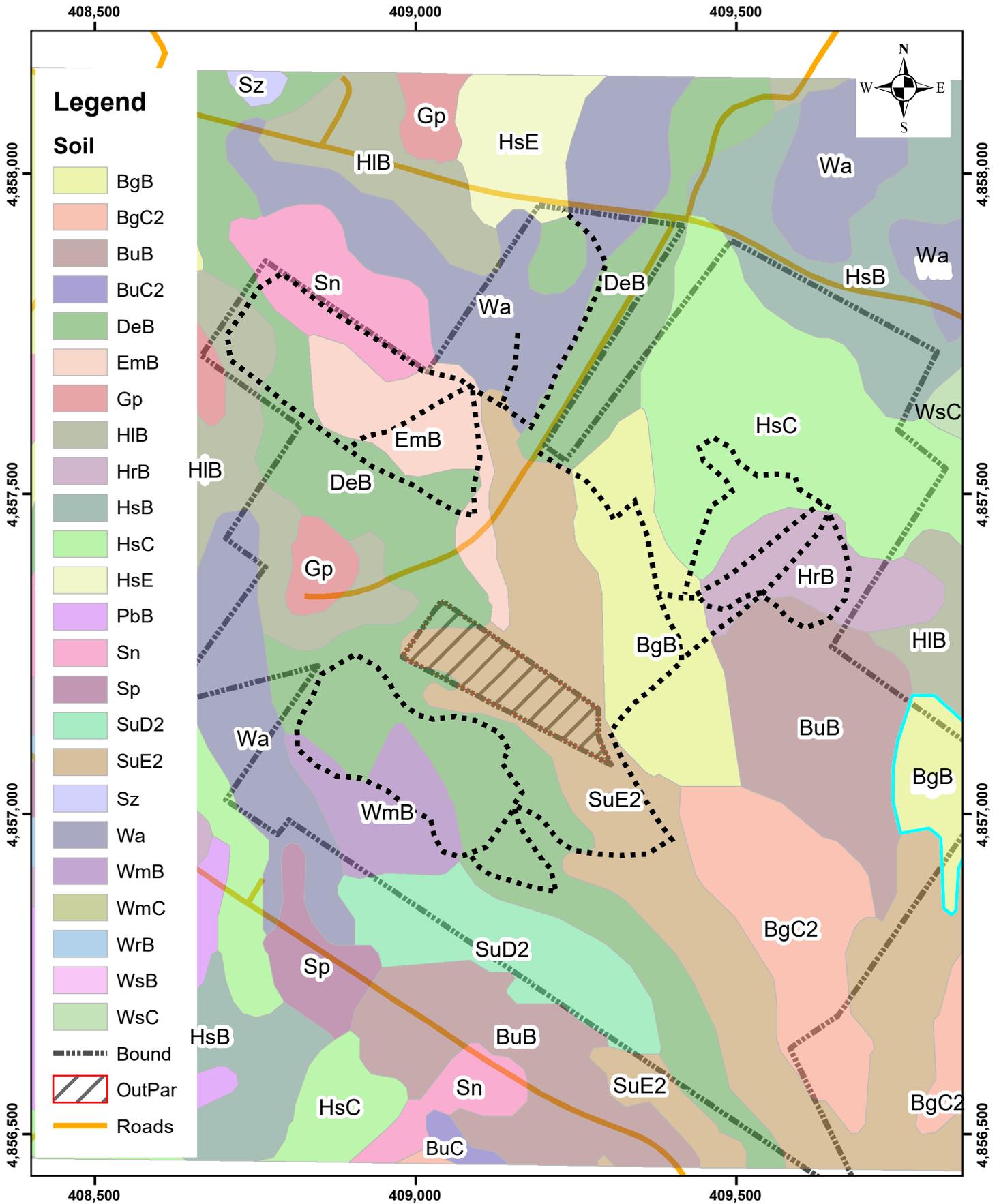


Prepared by the Freeport Planning Department
August 2017

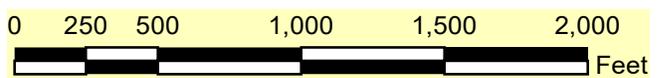


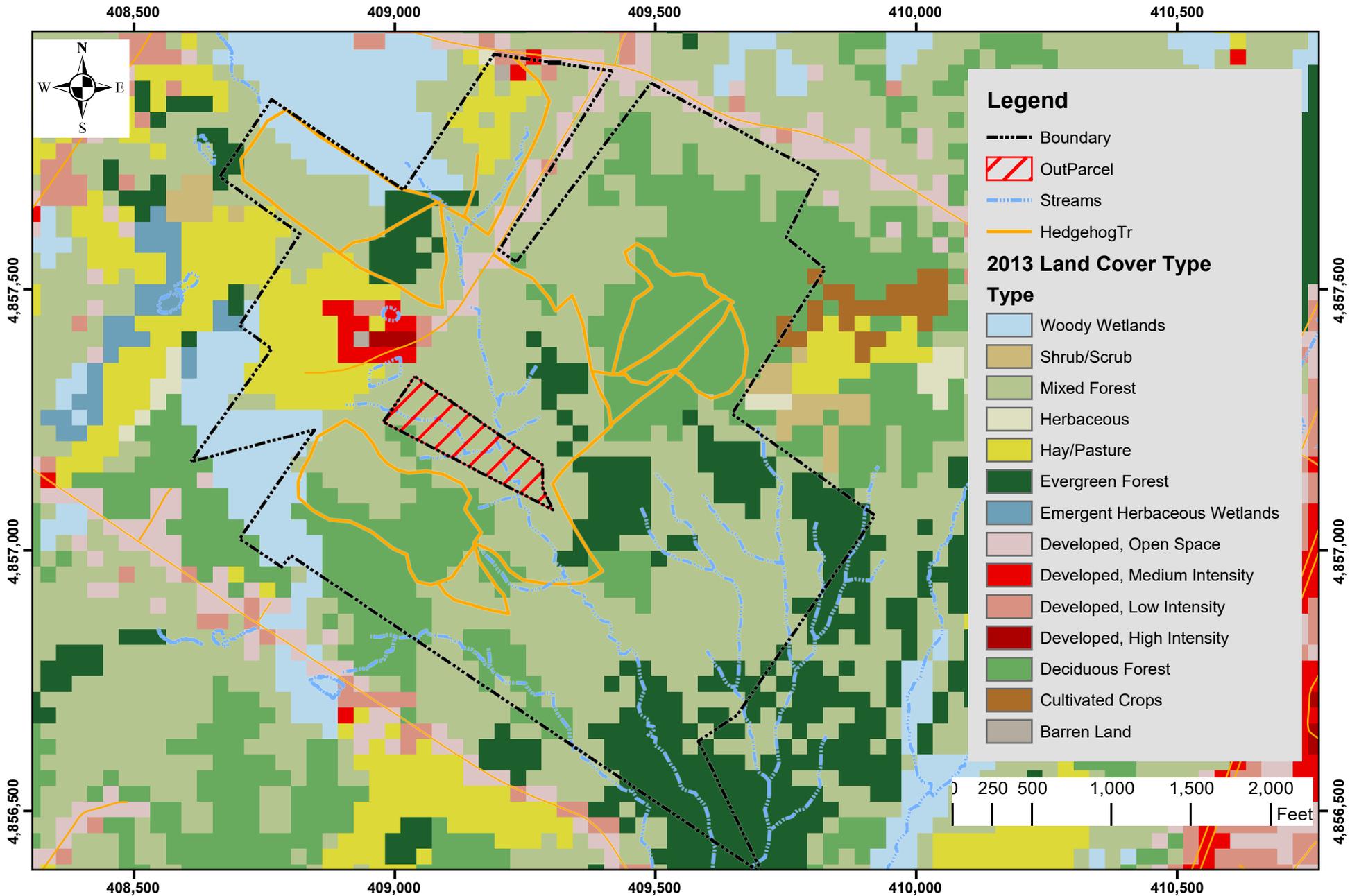
10-Foot Contour Map based on Oct. 2021 LiDAR
Hedgehog Mtn, Freeport, ME
 Grid is UTM, Zone 19N, Meters
 RGG April 10, 2022





NRCS Soil Types
Hedgehog Mtn, Freeport, ME
 Grid is UTM NAD83, Zone 19N, meters
 RGG April 18, 2022





2013 Land Cover Type Interpreted by 30x30 m Satellite Imagery
Hedgehog Mtn, Freeport, ME
Grid is UTM NAD83, Zone 19N, meters
RGG April 9, 2022

Highly Erodible Soils

When surface vegetation is removed from large areas of land, soil erosion often results. Sediment, the result of erosion, has a number of adverse effects as a pollutant. In suspension it reduces the amount of sunlight available to aquatic plants, covers fish spawning areas and food supplies and clogs gills of fish. Phosphorus moves into receiving waters attached to soil particles. Excessive quantities can cause algae blooms. Sediment fills drainage ditches, road ditches and stream channels and shortens the life of reservoirs. Highly erodible soils are those soils that have a potential to erode at a rate far greater than what is considered tolerable soil loss. The potential erodibility of a soil takes into consideration a) rainfall and runoff, b) the susceptibility of the soil to erosion and c) the combined effects of slope length and steepness. A highly erodible soil has a potential erodibility that would cause a considerable decline in long term productivity of that soil as well as possible negative effects on water quality.

HIGHLY ERODIBLE SOILS IN CUMBERLAND COUNTY AND PARTS OF OXFORD COUNTY, MAINE

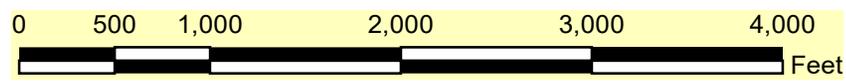
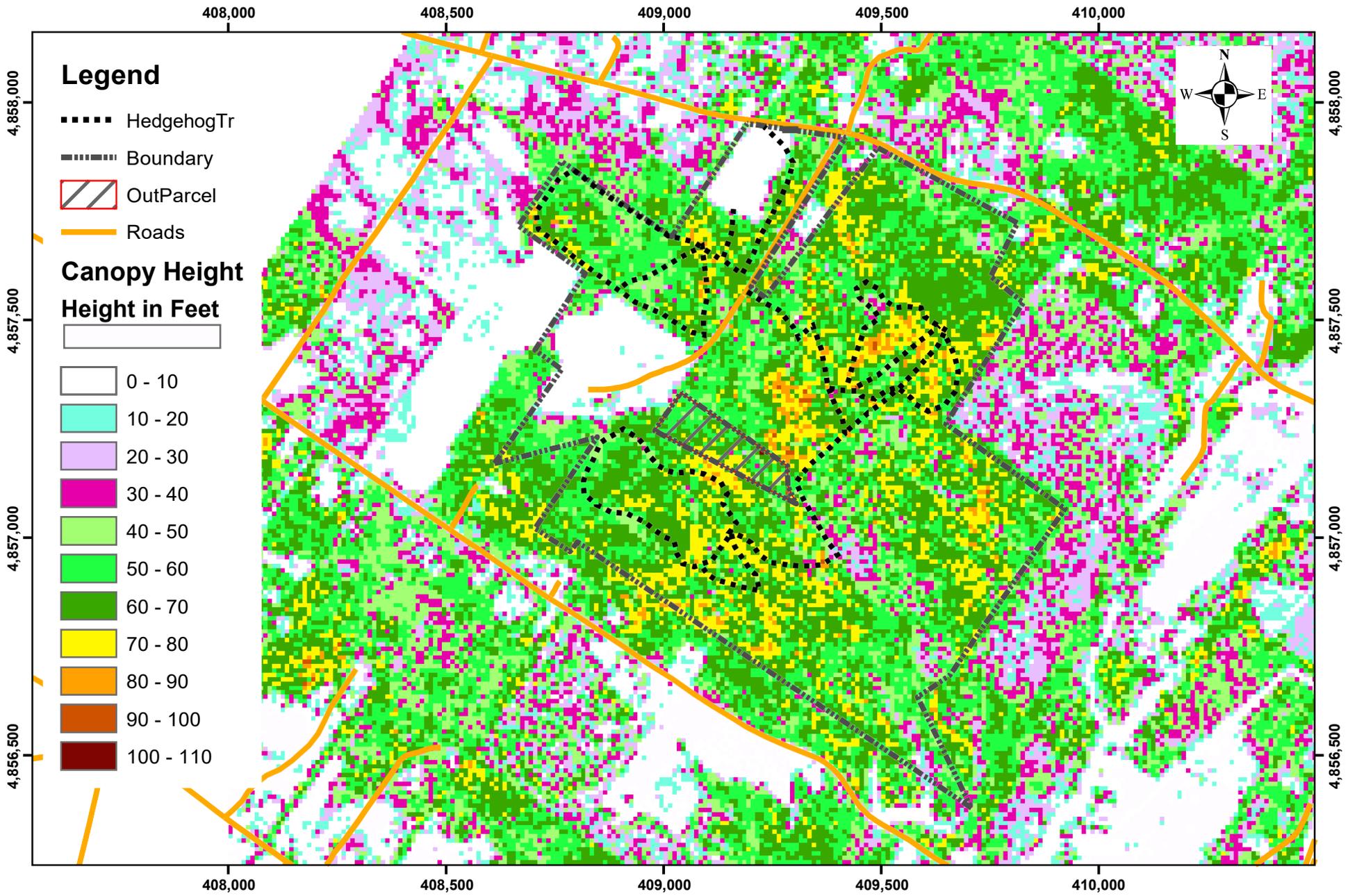
The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. This list of HEL soils is frozen as of 1987.

Publication Symbol	Map Unit Name
AbE	Abram-rock outcrop complex, 15 to 80 percent slopes
ACE	Abram-rock outcrop-lyman complex, very hilly
Add	Adams Loamy Sand, 15 to 25 percent slopes
AED	Adams loamy sand, moderately steep
AHD	Adams-hermon association, moderately steep
BeD	Becket fine sandy loam, 15 to 25 percent slopes
BgC2	Belgrade very fine sandy loam, 8 to 15 percent slopes, eroded
BkD	Becket fine sandy loam, 15 to 35 percent slopes, very stony
BuC2	Buxton silt loam, 8 to 15 percent slopes, eroded
CaC	Canaan sandy loam, 8 to 15 percent slopes
CeE	Canaan very rocky sandy loam, 20 to 60 percent slopes
DsC	Dixfield fine sandy loam, 8 to 20 percent slopes, very stony
DXD	Dixfield-marlow association, moderately steep, very stony
HfC2	Hartland very fine sandy loam, 8 to 15 percent slopes, eroded
HfD2	Hartland very fine sandy loam, 15 to 25 percent slopes, eroded
HgD	Hermon sandy loam, 15 to 25 percent slopes
HhD	Hermon very stony sandy loam, 15 to 35 percent slopes
HkE	Hermon extremely stony sandy loam, 20 to 60 percent slopes
HlD	Hinckley gravelly sandy loam, 15 to 25 percent slopes
HmD	Hermon sandy loam, 15 to 35 percent slopes, very stony
HnD	Hinckley-suffield complex, 15 to 25 percent slopes
HrC	Hollis fine sandy loam, 8 to 15 percent slopes
HrD	Hollis fine sandy loam, 15 to 25 percent slopes
HsE	Hollis very rocky fine sandy loam, 20 to 35 percent slopes
HTD	Hermon and monadnock soils, moderately steep, very stony
HTE	Hermon and monadnock soils, steep, very stony
LtD	Lyman-tunbridge complex, 15 to 35 percent slopes, very stony
LUD	Lyman-tunbridge-becket complex, hilly, very stony
LUE	Lyman-tunbridge-becket complex, very hilly, very stony
LWD	Lyman-tunbridge-monadnock complex, hilly, very stony
LWE	Lyman-tunbridge-monadnock complex, very hilly, very stony

Publication
Symbol

Map Unit Name

LyC	Lyman fine sandy loam, 8 to 15 percent slopes
LzC	Lyman very rocky fine sandy loam, 8 to 20 percent slopes
LzE	Lyman very rocky fine sandy loam, 20 to 45 percent slopes
MvD	Monadnock fine sandy loam, 15 to 35 percent slopes, very stony
PbD	Paxton fine sandy loam, 15 to 25 percent slopes
PfD	Paxton very stony fine sandy loam, 15 to 25 percent slopes
SnD	Skerry fine sandy loam, 15 to 25 percent slopes, very stony
SOD	Skerry-becket association, moderately steep
SRD	Skerry-becket association, moderately steep, very stony
STD	Skerry-colonel association, moderately steep, very stony
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded
SuD2	Suffield silt loam, 15 to 25 percent slopes, eroded
SuE2	Suffield silt loam, 25 to 45 percent slopes, eroded
TyD	Tunbridge-lyman complex, 15 to 35 percent slopes



Sources Cited

Amanda Devine, MS Botany, Maine Coast Heritage Trust
Beginning with Habitat, Maine Natural Areas Program
Christian Schorn, MS Plant Biology, Mid Coast Conservancy
Conservation Commission Ordinance #35, Town of Freeport
Josh Matijas, Assistant Regional Wildlife Biologist, Maine Department of Inland Fisheries and Wildlife
Maine Climate Council
Maine Department of Agriculture, Conservation, and Forestry
Open Space and Public Access Plan, Town of Freeport
Robert Gerber, Professional Engineer & Certified Geologist
Town of Freeport Comprehensive Plan, 2011
United States Census Bureau
United States Department of Agriculture, "Highly Erodible Soils of Cumberland County and Parts of Oxford County, Maine"
Woodlot Alternatives, Inc (now Stantec)

Maps Sources

Property Boundary—All figures show the boundaries as derived from parcel mapping for the Town of Freeport downloaded prior to 2019. (We will produce a GIS-based boundary survey map if we can obtain survey plans from the Town or its surveyors. However, we will not re-do the maps that have already been done using the MEGIS digital parcel maps.)

Sources of maps using LiDAR-derived information—Four panels of raw LiDAR flown in October 2021 at one meter resolution were downloaded from the NOAA LiDAR website in *.laz compressed format to cover the Hedgehog Mountain property:

[USGS_LPC_ME_SouthCoastal_2020_A20_19TDJ408857.las](#) [USGS_LPC_ME_SouthCoastal_2020_A20_19TDJ409855.las](#)
[USGS_LPC_ME_SouthCoastal_2020_A20_19TDJ408855.las](#) [USGS_LPC_ME_SouthCoastal_2020_A20_19TDJ409857.las](#)

These files were processed in ArcPro 2.9.2 using a series of routines requiring a 3D Analyst Extension to decompress the data and transform the data to the UTM NAD83 Zone 19N projection in meters with a vertical datum of NAVD88 in meters. These files were then used to:

- 1) create Digital Elevation Maps (DEMs) of elevation data for bare earth (ground) at 1-meter and 10-meter resolution using kriging;
- 2) create DEMs of first returns (top of canopy) at 10-meter resolution using kriging;
- 3) create a mosaic of the four DEMs for bare earth and for the last returns;
- 4) contour the bare earth data in feet with both 2-foot and 10-foot contour intervals based on 1-meter grid DEMs;
- 5) subtract the 10-meter ground grid DEM from the 10-meter first return grid DEM to generate a height of canopy DEM;
- 6) produce a raised relief map from the 1-meter ground LiDAR DEM using a 45° sun angle from 235° from grid north and a Z-factor of 10; and
- 7) produce a slope map with the percent-slope characterization shown on the figure.

The Land Cover Type Map was interpreted by the National Land Cover Type program under the general supervision of the US Geological Survey based on a grid of approximately 30-meter square cells of satellite imagery obtained in this area in 2013.

The Soils map is a digital download of the Cumberland County soil series from the website of the National Resources Conservation Service of the US Dept. of Agriculture. Within each distinct mapped polygon on the map, the soil series name, soil series texture, estimated slope range, degree of stoniness, and erosion condition may be printed as a label.