New Hampshire Fish & Game Department
Spatial Data Notes

DATA LAYER:	Rocky-ridge/Talus slope habitats of New Hampshire
COVER NAME:	ridge_talus
COVER CONTENTS:	rocky-ridge and talus slope habitat polygons
COVER TYPE:	Poly
SOURCE:	TNC ecological land units; NH County Soils Surveys; USGS 30m DEM
SOURCE SCALE:	1:24,000 and 30-meter raster
SOURCE MEDIA:	digital
COORDINATE SYSTEM:	NH Stateplane feet; horizontal datum NAD83
TILE:	State
AUTOMATED BY:	NH Fish & Game Department
STATUS:	Complete
LAST REVISION:	August 2005; attributes revised April 2006; metadata revised July 2006

General Description of the Data

- Development of this coverage provides general rocky-ridge and talus slope habitat locations within the state of New Hampshire. Analysis was completed for incorporation into the New Hampshire Wildlife Action Plan. Funding for the Plan was provided by State Wildlife Grants administered by the US Fish & Wildlife Service.

- Talus slopes range from open, lichen covered talus “barrens” to closed-canopy forested talus communities (Sperduto and Nichols 2004). Rocky ridges generally occur on outcrops and shallow-to-bedrock ridge and summit settings (Sperduto and Nichols 2004).

- To attempt to map potential locations for these habitats/communities, existing NHB exemplary rocky ridge and talus community polygons were overlayed atop landforms delineated within The Nature Conservancy’s Ecological Landunit (ELU) datalayer (TNC 2003) to determine if a correlation existed. Rocky ridges were found to occur on s-facing slide slopes, n-facing sideslopes, slope crests, steep slopes, and low hills. Talus slopes were found to occur on steep slopes, cliffs, s-facing side slopes, s-facing coves, and n-facing coves. The landforms associated with rocky ridges were then combined with concave and neutral surfaces generated from 30-m digital elevation model data to attempt to predict other occurrences of this community type, while talus slope landforms were combined with convex and neutral surfaces identified from a 30-m DEM. In addition to there being tremendous overlap between the areas predicted for both, a significant amount of the state was predicted as being one or the other community type. As such other data was investigated to create a better habitat/community model.

- Data within the NH county soil surveys was found to be the best current alternative for mapping potential locations of rocky ridges and talus slopes. Rocky ridges are typically found in areas that are shallow to bedrock. Shallow to bedrock areas were isolated from the soils layers using the data fields, “bedrock_shallow,” defined as the distance from the soil surface to the shallowest depth to bedrock for any of the major components, and “bedrock_deep” defined as the distance from the soil surface to the deepest depth to bedrock for any of the major components using the parameters outlined in Table 1.

Table 1. Parameters used to identify shallow to bedrock areas using county soil survey data provided by GRANIT at Complex Systems Research Center, UNH (2003).

County	Bedrock Shallow Depth (cm)	Bedrock Deep Depth (cm)	# Polygons
Belknap	--	--	--
Carroll	0	0, 20	132
Cheshire	0	0	15
Coos	0	0, 20, 26	39
Grafton	0	20, 26	60
Hillsborough East[b]	NA	NA	NA
Hillsborough West	0	0[a]	37
Merrimack	--	--	--
Rockingham	0	40	75
Strafford	0	0[a]	4
Sullivan	0	0[a]	10
Total			**372**

Soils data not available for Belknap or Merrimack counties.

[a] Next lowest available depth was 40 cm which would have resulted in an unreasonable increase in the number of polygons identified (e.g., hundreds of polygons being selected rather than < 100 polygons).

[b] Hillsborough East was left out of this analysis because lowest "Bedrock Deep Depth" available was 40 cm, which would have resulted in an unreasonable number of polygons being identified.

Shallow to bedrock areas identified using these parameters tended to be classified as rock outcrops many with steep or very steep slopes. It is reasonable to assume that many such areas could actually be talus slopes. As such, the two communities were lumped for this analysis.

- The polygons identified by the soils analysis were combined with known NHB exemplary rocky ridge and talus slope exemplary natural communities. The NHB rocky ridge communities that were included were:

  Appalachian oak - pine rocky ridge
  Chestnut oak forest/woodland
  Dry Appalachian oak - hickory forest
  Jack pine rocky ridge woodland
  Montane acidic cliff
  Montane heath woodland
  Red oak - ironwood - Pennsylvania sedge woodland
  Red oak - pine rocky ridge
  Red pine rocky ridge
  Red spruce - heath - cinquefoil rocky ridge

  The NHB talus slope communities that were included were:

  Montane lichen talus barren
  Red oak - black birch wooded talus
  Red oak - hickory wooded talus
  Spruce - birch - mountain maple wooded talus
  Subalpine cold-air talus barren

Polygons were then delineated as being either “NHB Ridge” for known locations of rocky ridge communities, “NHB Talus” for known locations of talus barren communities, or “Potential” for areas that could potentially be either.

- Even though soils data currently is the best available data to map potential rocky ridge and talus slope communities, using soils data alone accurately predicted only 4 of 20 (20%) NHB talus communities and 29 of 92 (32%) NHB rocky ridge communities. As such, there are likely substantially more rocky ridge and talus slope communities in the state than what this model currently predicts. Since much of the soils data is based on interpretation of aerial photos and topographic maps, errors of omission or commission are possible. The extant of these errors is currently unknown. Field verification will need to take place to better ascertain levels of error.

Item definitions for RIDGE_TALUS polygon attributes

ITEM NAME	WDTH	TYPE	N.DEC	DESCRIPTION
FGID	5	I	0	(*unique, sequential ID number*)
STATUS	15	C	0	KNOWN or POTENTIAL
UNIT_NAME	50	C	0	Name of conservation planning unit
AREA_FEET	8	F	3	area (square feet) calculated by software
PERIMETER	8	F	3	perimeter length (feet) calculated by software
ACRES	8	N	1	area (acres)
HECTARES	8	N	2	area (hectares)
LANDHA	8	N	2	land area (hectares)
LANDSQKM	8	N	2	land area (square kilometers)
DOTROADKM	8	N	2	Km of all NHDOT roads
DENSROADS	5	N	2	Density of all DOT roads (km/km2)
DOTMAJORKM	8	N	2	Km of all state and town roads
DENSMAJOR	5	N	2	Density of all state and town roads
DISTROUTE	8	I	0	Distance to nearest route (meters)
DOTMINORKM	8	N	2	Km of all unmaintained roads and private roads
DENSMINOR	5	N	2	Density of unmaintained and private roads
DISTROAD	8	I	0	Distance to nearest road (meters)
CONSFO	8	N	2	Area in conservation/fee ownership (hectares)
CONSFO_PCT	5	N	1	Percent in conservation/fee ownership
CONSCE	8	N	2	Area in conservation/easement or other (ha)
CONSCE_PCT	5	N	1	Percent in conservation/easement or other
CONSHA	8	N	2	Area in conservation (ha)
CONS_PCT	5	N	1	Percent in conservation
BUILDHA	8	N	2	Buildable area (hectares)
CONSTRNDHA	8	N	2	Buildable with constraints (ha)
BUILDPCT	5	N	1	Percent of area that is buildable (incl constrained)
NREL4HA	8	N	2	Natl’ Renewable Energy Laboratory wind power class 4
NREL4PCT	5	N	1	hectares and percent (commercial turbine potential)
NREL2HA	8	N	2	Natl’ Renewable Energy Laboratory wind power class 2
NREL2PCT	5	N	1	hectares and percent (small turbine potential)
NREL4DIST	5	N	1	Distance to nearest NREL class4 of 4+ acres in size (m)
TOWERCNT	3	I	0	Number of communication towers in the unit
TOWERHT	3	I	0	Max height of communication towers in the unit
TOWERDIST	8	I	0	Distance to nearest communication tower (m)
HIKEKM	8	N	1	Total length of hiking trails in the unit (km)
HIKEDENS	5	N	2	Density of hiking trails in the unit (km/km2)
DISTHIKE	8	I	0	Distance to nearest hiking trail (meters)
TRANSKM	8	N	1	Total length of power transmission lines
TRANSDENS	5	N	2	Density of power transmission lines (km/km2)
DISTTRANS	8	I	0	Distance to nearest power transmission line or pipeline (m)

Item definitions for RIDGE_TALUS polygon attributes: (continued)

ITEM NAME	WDTH	TYPE	N.DEC	DESCRIPTION
RAILKM	8	N	1	Total length of active and abandoned railroad (km)
RAILDENS	5	N	2	Density of railroad (km/km2)
DISTRAIL	8	I	0	Distance to nearest railroad (meters)
ELU30VAR	3	I	0	Variety of Ecological Land Units (ELU30 = elevation, substrate, landform)
AREA_M2	8	N	1	Total size of area/unit (square meters)
PERIM_M	8	N	1	Total perimeter of area/unit (meters)
NEARDIST	8	I	0	Distance to nearest neighboring area/unit (meters)
NEAR_FGID	4	I	0	ID of nearest neighbor
SHAPEINDEX	5	N	1	Shape index (value of 1 is nearly square)
PROXINDEX	5	N	1	Proximity index
A_RICH_BUF	3	I	0	Species richness of rare animals within their dispersal distances from the polygon
A_SF_BUF	3	I	0	Num. of source features of rare animals within dispersal distances
A_SHAN_BUF	3	N	3	Shannon diversity index of rare animal source features within their dispersal distances from the polygon
A_RICH_POL	3	I	0	Species richness of rare animals within polygon
A_SF_POLY	3	I	0	Number of source features of rare animals within polygon
A_SHAN_POL	3	N	3	Shannon diversity index of rare animal source features in poly
P_RICH_BUF	3	I	0	Species richness of rare plants within 1km of polygon
P_SF_BUF	3	I	0	Number of source features of rare plants within 1km of polygon
P_SHAN_BUF	3	N	3	Shannon diversity index of rare plant source features within 1km
P_COND_BUF	2	C	0	Average rank of rare plant source features within 1km of polygon
P_DISP_BUF	3	N	3	Dispersal of rare plant source features within 1km of polygon
P_RICH_POL	3	I	0	Species richness of rare plants in polygon
P_SF_POLY	3	I	0	Number of source features of rare plants in polygon
P_SHAN_POL	3	N	3	Shannon diversity index of rare plant source features in polygon
C_RICH_BUF	3	I	0	Richness of rare and exemplary natural communities within 1km
C_SF_BUF	3	I	0	Number of source features of rare and exemplary natural communities within 1km of polygon
C_COND_BUF	2	C	0	Average rank of rare and exemplary natural community source features within 1km of polygon
C_AREA_BUF	3	N	3	Percent of area within 1km of polygon that is rare or exemplary natural community
C_AREA_POL	6	N	3	Percent of polygon that is rare or exemplary natural community
C_RICH_POL	3	I	0	Richness of rare and exemplary natural communities in polygon
C_SF_POLY	3	I	0	Number of source features of rare and exemplary natural communities in polygon
IFESMEAN	2	I	0	Integrated Fragmentation Effects Surface score (Zankel, 2005)
HG_GEM	16	N	6	Average deposition of gaseous elemental mercury (GEM) via assimilation into tree foliage by land cover type within the polygon (Miller et al, 2005)
HG_TOT	16	N	6	Average total deposition of mercury (wet [precipitation + cloud water interception] + dry [GEM + RGM + aerosol]) by land cover type within the polygon (Miller et al, 2005)
CA_INDEX	16	N	6	Avg deposition index, rate of cation depletion per ha/per year (Miller et al, 2005)
GAP123HA	8	N	2	Area in GAP mgt status 1,2 or 3 (TNC 2005)
GAP123PCT	5	N	1	Percent in GAP mgt status 1,2 or 3 (TNC 2005)
HAB	8	C	0	Habitat name (abbrv)
BIO	8	N	2	Raw biological score (high score = high quality)
LAND	8	N	2	Raw landscape score (high score = high quality)
HUMAN	8	N	2	Raw human impact score (high score = low impact)
COND	8	N	3	Raw habitat condition score (high score = good condition)

Item definitions for RIDGE_TALUS polygon attributes: (continued)

ITEM NAME	WDTH	TYPE	N.DEC	DESCRIPTION
DEV	8	N	3	Raw development risk (high score = high risk)
RISK	8	N	3	Raw risk score (high score = high risk)
SUBBIO	3	I	0	Subsection biological rank (high rank = high quality)
SUBLAND	3	I	0	Subsection landscape rank (high rank = high quality)
SUBHUMN	3	I	0	Subsection human impact rank (high rank = low impact)
SUBCOND	3	I	0	Subsection habitat condition rank (high rank = good condition)
SUBDEV	3	I	0	Subsection development risk (high rank = high risk)
SUBRISK	3	I	0	Subsection risk rank (high rank = high risk)
NHBIO	3	I	0	Statewide biological rank (high rank = high quality)
NHLAND	3	I	0	Statewide landscape rank (high rank = high quality)
NHHUMN	3	I	0	Statewide human impact rank (high rank = low impact)
NHCOND	3	I	0	Statewide habitat condition rank (high rank = good condition)
NHDEV	3	I	0	Statewide development risk rank (high rank = high risk)
NHRISK	3	I	0	Statewide risk rank (high rank = high risk)
PRIORITY	50	C	0	WAP Priority (state and regional rank)
ECOSUB	40	C	0	Ecoregional subsection

NOTES

BIO1 Condition score = ($A\_RICH\_BUFF_R$*.25) + ($A\_RICH\_POL_R$*.25) + ($P\_RICH\_POL_R$*.25) + ($C\_RICH\_POL_R$*.25)
where all biological variables are positive indicators of biological quality and subscript denotes percentile rank, thus “good” sites score high (maximum percentile rank=100) and “poor” sites score low (minimum percentile rank=0).

LAND1 Condition score = ($HECTARES_R$*.34) + ($PROXINDEX_R$*.33) + ($ELU30VAR_R$*.33)
where all landscape variables are positive indicators of landscape integrity and subscript R denotes percentile rank, thus “good” sites score high (maximum percentile rank=100) and “poor” sites score low (minimum percentile rank=0).

HUMAN1 Condition score = ($IFESMEAN_R$*.2) + ($HIKEDENS_R$*.2) + ($DISTHIKE_R$*.2) + ($HGTOT_R$*.2) + ($CAINDEX_R$*.2) where deleterious human impact variables have been transformed so that all variables are positive indicators of ecological integrity and subscript R denotes percentile rank, thus “good” sites score high (maximum percentile rank=100) and “poor” sites score low (minimum percentile rank=0).

COND1 The condition index = (BIO1+LAND1+HUMAN1)/3 as defined above

Digital data describing atmospheric deposition of mercury were provided by Ecosystems Research Group, Ltd. using the methods described in Miller et al. (2005). Digital data describing the risk of calcium and other base cation depletion and limitation in forested ecosystems provided by Ecosystems Research Group, Ltd. using methods described in Miller (2005).

The list above represents the complete set of attributes developed for the WAP habitat data layer. Only select attributes are distributed in the public release version WAP data layers. For more information, please contact the NH Fish and Game Department, Wildlife Division, 11 Hazen Dr, Concord NH 03301 Phone: (603) 271-2461 E-mail: wilddiv@wildlife.state.nh.us

LITERATURE AND DIGITAL DATA CITED:

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