New Hampshire Fish & Game Department
Spatial Data Notes

DATA LAYER: Alpine habitats of New Hampshire
COVER NAME: alpine
COVER CONTENTS: Alpine habitat polygons
COVER TYPE: Poly
SOURCE: Hale and Rock (2003) landcover analysis for the White Mountain National Forest, Appalachian Mountain Club (AMC) alpine habitat polygons for the Presidential Range and Franconia Ridge, NH Natural Heritage Bureau (NHB) exemplary alpine natural communities.
SOURCE SCALE: 30-meter (elevation, land cover data); sources vary
SOURCE MEDIA: digital
COORDINATE SYSTEM: NH State Plane feet, horizontal datum NAD83
TILE: State
AUTOMATED BY: NH Fish & Game Department, GIS Program
STATUS: Complete
LAST REVISION: June 2005; attributes revised December 2009

General Description of the Data

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

- The definition of alpine habitat used in this analysis was areas with vegetation 8 feet in height that graduated down to open rock. These areas were identified by isolating patches containing both krummholz and open rock per Hale and Rock's (2003) landcover classification for the White Mountain National Forest. The grid reclassified from Hale's land cover was generalized using the BOUNDARYCLEAN command (ascend twoway), following instruction in similar analysis done by USDA Forest Service. The results were converted to polygons with smooth boundaries. Only polygons 5+ acres in size, and having occurrences of both Hale land cover types (krummholz, open rock) were retained.

- The land cover derived polygons were then combined with AMC's data depicting alpine areas in the Presidential Range and Franconia Ridge, and NHB's data depicting exemplary alpine communities to ensure all alpine areas were captured to the extent possible. The NHB natural communities that were included were:

  Alpine herbaceous snowbank/rill
  Alpine ravine/snowbank system
  Alpine tundra system
  Alpine/subalpine bog system
  Black spruce – balsam fir krummholz
  Labrador tea heath – krummholz
  Montane heath woodland
  NE alpine community
  NE alpine/subalpine pond
  Red spruce – heath – cinquefoil rocky ridge
  Sedge – rush – heath meadow
  Subalpine cold-air talus barren
  Subalpine heath – krummholz/rocky bald system
  Subalpine rocky bald

These communities were classified as being either diagnostic of alpine communities or peripheral/occasional and overlapped with the other two data sources. Refer to "Natural Communities of New Hampshire" (Sperduto and Nichols 2004) for more information on these natural community types.

- Any NHB alpine community below 3400 ft elevation was excluded, even if diagnostic.

- Any NHB peripheral/occasional alpine community above 3400 ft but greater than ¼ mile from either a diagnostic community or the results of the other data sources, was also excluded
  Except for: South Twin Mtn, Mt Clinton (Pierce), and Baldface – these were included in Alpine.

Item definitions for ALPINE polygon attributes:

ITEM NAME	DESCRIPTION
FGID	sequential ID number
NAME	Name given to each alpine polygon.
COUNT	polygons in the area or unit
UNITNAME	Name given to each conservation planning unit
ACRES	Area (acres)
HECTARES	Area (hectares)
HIKEDENS	Hiking trail density in the area/unit (km/km2)
ELU30VAR	Variety of ecological land units (ELU30 = elevation, substrate, landform)
AREA_M2	Total size of area/unit (square meters)
PERIM_M	Total perimeter of area/unit (meters)
NEARDIST	Distance to nearest neighboring area/unit (meters)
NEAR_FGID	ID of nearest neighbor
PROXINDEX	Proximity index
SHAPEINDEX	Shape index
HG_TOT	Average total deposition of mercury (wet [precipitation + cloud water interception] + dry [GEM + RGM + aerosol]) by land cover (Miller et al, 2005)
CA_INDEX	Average deposition index, rate of cation depletion per ha/per year (Miller et al, 2005)
A_RICH_BUF	Species richness of rare animals within their dispersal distances (2009)
A_RICH_POL	Species richness of rare animals within polygon (2009)
P_RICH_POL	Species richness of rare plants in polygon (2009)
C_RICH_POL	Richness of rare and exemplary natural communities in polygon (2009)
BIO	Raw biological score (high score = high quality)
LAND	Raw landscape score (high score = high quality)
HUMAN	Raw human impact score (high score = low impact)
COND	Raw habitat condition score (high score = good condition)
ECOSUB	Ecoregional subsection
PRIORITY	Priority
CONS_AC	Conservation (acres)
CONS_PCT	Conservation (percent)

NOTES:

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

NOTES: (continued)

LAND   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).

HUMAN   Condition = $(HIKEDENS_R*.34) + (HG\_TOT_R*.33) + (CA\_INDEX_R*.33)$
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).

COND   Condition index = (BIO+LAND+HUMAN)/3 as defined above

The fields: A_RICH_BUF, A_RICH_POL, P_RICH_POL and C_RICH_POL, provide species richness counts (number of different species potentially present in the habitat polygon) from the NH Natural Heritage Bureau as of December 2008. Care must be taken in interpreting these counts as most areas of NH have never been surveyed for biodiversity elements. See *Important Background Information for Interpreting Species Richness Counts based on NH Natural Heritage Bureau Data* for details.

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: wildlife@wildlife.nh.gov

DATA SOURCES:

Sperduto, D.D. and W.F. Nichols. 2004. Natural communities of New Hampshire.
    The NH Natural Heritage Bureau and The Nature Conservancy. 229pp.

Hale, S.R., and B.N. Rock. 2003. Impact of topographic normalization on land-cover classification
    accuracy. Photogrammetric Engineering & Remote Sensing 69:785–791.

Hale, Stephen R. 2001. Using Satellite Remote Sensing to Model and Map the Distribution of Bicknell's
    Thrush (Catharus bicknelli) in the White Mountains of New Hampshire, Doctoral Dissertation,
    University of New Hampshire, Durham, NH.

Miller, E.K. VanArsdale, A., Keeler, G.J., Chalmers, A., Poissant, L., Kamman, N., and Brulotte, R. 2005.
    Estimation and Mapping of Wet and Dry Mercury Deposition across Northeastern North America.
    Ecotoxicology 14: 53-70.

Miller, E.K. 2005. Assessment of Forest Sensitivity to Nitrogen and Sulfur Deposition in New Hampshire
    and Vermont. Project report dated 12/15/2005. New Hampshire Department of Environmental
    Services, 29 Hazen Dr, Concord NH 03302. 18 pp.

NH Natural Heritage Bureau BIOTICS database January 21, 2009 (species/community richness)

The Nature Conservancy, Conservation Science Support. 2008. *Ecological Land Units*. 30m raster data.
    Available from TNC, Eastern Resource Office, Boston, MA.

The Nature Conservancy (J. Tollefson). 2005. GAP Status Assessment of NH Conservation Lands.
    Unpublished report to the NH Fish and Game Department.

United States Geological Survey. Date varies, complete by 2003. *National Elevation Dataset*. 30m raster
    data. Projected by Complex Systems Research Center in January 2005, available from GRANIT,
    University of New Hampshire.

Wind power raster data provided by Massachusetts Technology Collaborative. (June 2003).
    Developed by TrueWind Solutions, LLC under contract to AWS Scientific, Inc as part of a project
    jointly funded by the Connecticut Clean Energy Fund, Mass. Technology Collaborative, and
    Northeast Utilities System.

Zankel, M. 2005. Integrated Fragmentation Surface for the State of New Hampshire.
    The Nature Conservancy, Concord NH. Unpublished report to NH Fish and Game Department.