

The Nature Conservancy and New Hampshire Fish & Game Department Spatial Data Notes

DATA LAYER: Appalachian oak-pine habitats of New Hampshire
COVER NAME: appoakpine
COVER CONTENTS: Appalachian oak-pine habitat polygons
COVER TYPE: polygon
SOURCE: The Nature Conservancy, New Hampshire Department of Fish and Game, NH Audubon, and New Hampshire Natural Heritage model criteria
SOURCE SCALE: 1:24,000 and 30-meter raster
SOURCE MEDIA: digital
COORDINATE SYSTEM: NH State Plane feet, horizontal datum NAD83
TILE: State
AUTOMATED BY: The Nature Conservancy, New Hampshire Chapter
STATUS: Complete
LAST REVISION: May 2005; attributes revised April 2006 (NHFGD); metadata June 2006

General Description of the Data

- Development of this coverage provides general Appalachian oak-pine 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.
- Relevant forested 2001 NH Land Cover Assessment grid values were combined with elevation ranges from sea level to 900' based on criteria developed by experts from The Nature Conservancy, New Hampshire Fish and Game, NH Audubon, and the NH Natural Heritage Bureau.
- Ecological Land Units, created by The Nature Conservancy's Conservation Science Support, were also added to capture additional areas likely to have geo-physical conditions favorable to Appalachian oak-pine, or remove areas likely to have geo-physical conditions unfavorable to Appalachian oak-pine. North-facing sideslopes and north-facing coves were removed from some land cover/elevation classes, and some land cover/elevation classes were restricted to only south-facing sideslopes and south-facing coves.
- NH Natural Heritage Bureau mapped exemplary Dry Appalachian oak-hickory forest, Mesic Appalachian oak-hickory forest, Appalachian oak-mountain laurel forest, and Semi-rich Appalachian oak-sugar maple forest systems were added to ensure that known Appalachian oak-pine locations were captured. These data do not capture all existing locations of these communities, only those that have been mapped by NHHB.
- To further refine the model, soil types associated with Appalachian oak-pine were selected from county soil data, where available (Merrimack county soils have not been digitized). The soils were selected, then clipped to only include forested areas, and added to the existing model information. The same was done for hemlock-hardwood-pine, and then Appalachian oak-pine was used to erase areas from hemlock-hardwood-pine where there was overlap, so that Appalachian oak-pine takes precedence over hemlock-hardwood-pine. This process is expected to somewhat over-predict locations of Appalachian oak-pine, but better captures broad patterns of Appalachian oak-pine.

- Model results were reviewed by experts from The Nature Conservancy, the NH Fish and Game Department, and NH Heritage Bureau, who agreed that the broad patterns depicted by the model align with reasonable expectations. No ground truthing was conducted. This version of the model is considered a first iteration, and further refinements may be developed in the future.
- All data originating as raster was converted to vector for the model.
- The complete model criteria grid is available with the data layer. To obtain additional information, please contact The Nature Conservancy.

Item definitions for APPOAKPINE polygon attributes:

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
FGID	2	I	0	unique sequential polygon ID number
AREA	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	1	Kilometers of all NHDOT roads within the area/unit
DENSROADS	5	N	2	Road density in the area/unit (km/km ²)
DOTMAJORKM	8	N	1	Kilometers of NHDOT major roads in the area/unit
DENSMAJOR	5	N	2	Density of major roads (km/km ²)
DISTROUTE	8	I	0	Distance to nearest state route (meters)
DOTMINORKM	8	N	1	Kilometers of unmaintained and private roads in the area/unit
DENSMINOR	5	N	2	Density of unmaintained and private roads (km/km ²)
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	1	Area in conservation easement/other (hectares)
CONSCE_PCT	5	N	1	Percent in conservation easement/other (%)
CONSHA	8	N	2	Area in conservation (hectares)
CONS_PCT	5	N	1	Percent in conservation
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)
BUILDHA	8	N	2	Buildable area/generalized buildout analysis (hectares)
CNSTRNDHA	8	N	2	Buildable area with constraints (hectares)
BUILDPC	5	N	1	Percent area that is buildable
NREL4HA	8	N	2	Nat'l Renewable Energy Laboratory wind power class 4
NREL4PCT	5	N	1	hectares, percent (commercial turbine potential)
NREL2HA	8	N	2	Nat'l Renewable Energy Laboratory wind power class 2
NREL2PCT	5	N	1	hectares, percent (small turbine potential)
NREL4DIST	8	I	0	Distance to nearest NREL class 4 area gt 4 acres size
TOWERCNT	3	I	0	Number of communication towers in the area/unit (NHOEP)
TOWERHT	3	I	0	Maximum height of towers in the area/unit (feet)
TOWERDIST	8	I	0	Distance to nearest communication tower (meters)
HIKEKM	8	N	1	Kilometers of hiking trails within the area/unit (AMC, NHOEP)
HIKEDENS	5	N	2	Hiking trail density in the area/unit (km/km ²)
DISTHIKE	8	I	0	Distance to nearest hiking trail (meters)
TRANSKM	8	N	1	Kilometers of hiking trails within the area/unit (AMC, NHOEP)
TRANSDENS	5	N	2	Hiking trail density in the area/unit (km/km ²)
DISTTRANS	8	I	0	Distance to nearest transmission line (meters)

Item definitions for APPOAKPINE polygon attributes (continued):

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
RAILKM	8	N	1	Kilometers of active railroad within the area/unit (NHDOT)
RAILDENS	5	N	2	Rail density in the area/unit (km/km ²)
DISTRAIL	8	I	0	Distance to nearest railroad (meters)
ELUVAR	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
PROXINDEX	8	N	2	Proximity index
IFESMEAN	2	I	0	Mean IFES score (Integrated Fragmentation Effects Surface The Nature Conservancy; Zankel, 2005)
WETPCT	5	N	2	Percent wetland
A_RICH_BUF	3	I	0	Species richness of rare animals within their dispersal distances from the polygon
A_SF_BUF	3	I	0	Number of source features of rare animals within their dispersal distances from the polygon
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 of polygon
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
POP90X00	8	I	0	Change in population 1990 to 2000
POPDENXS	8	I	0	Change in population density 1990 to 2000
POP00SQMI	8	I	0	Population density in 2000 (persons per square mile)
HOUSES00	8	I	0	Housing units in 2000 (total count)
HU00SQMI	8	I	0	Housing units density in 2000 (houses per square mile)
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)

Item definitions for APPOAKPINE polygon attributes (continued):

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
CA_INDEX	16	N	6	Average deposition index, rate of cation depletion per ha/per year (Miller et al, 2005)
NHW	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
CHW	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
WP	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
WP_HEM_RS	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
BF_RS_WP_H	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
CHW_WP_HEM	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
NHW_WP_HEM	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
NHW_BF_RS_	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
NHW_BF_RS	7	N	3	hectares of this forest type, 1992 NLCD (Miller 2005)
GAPVERTRCH	7	N	1	Vertebrate species avg richness (VT/NH GAP Analysis)
GAPVERTMAX	3	I	0	Vertebrate species maximum (VT/NH GAP Analysis)
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)
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
ECOSUB	40	C	0	Ecoregional subsection
S1	1	C	0	Contains an occurrence of an S1 rank wildlife species
S2	1	C	0	Contains an occurrence of an S2 rank wildlife species
LEVEL1	1	C	0	Contains an occurrence of a WAP Level 1 wildlife species
LEVEL2	1	C	0	Contains an occurrence of a WAP Level 2 wildlife species
LEVEL3	1	C	0	Contains an occurrence of a WAP Level 3 wildlife species
LEVEL4	1	C	0	Contains an occurrence of a WAP Level 4 wildlife species

NOTES

- BIO2 Condition = (A_RICH_BUF_R*.1666) + (A_RICH_POL_R*.1666) + (P_RICH_POL_R*.1666) + (C_RICH_POL_R*.1666) + (MILLERPCT_R*.1666) + (GAPVERTMAX_R*.167)
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)
- LAND1 Condition = (HECTARES_R*.25) + (PROXINDEX_R*.25) + (WETPCT_R*.25) + (ELU30VAR_R*.25)
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)

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HUMAN2 Condition = (IFESMEAN_R*.167) + (ROAD_DENSITY_R*.1666) + (POP00SQMI_R*.1666) + (HU00SQMI_R*.1666) + (HG_TOT_R*.1666) + (CA_INDEX_R*.1666)
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)

COND2 Condition index = (BIO1+LAND1+HUMAN2)/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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