New Hampshire Fish & Game Department
Spatial Data Notes

DATA LAYER:	Pitch Pine/pine barrens habitat of New Hampshire
COVER NAME:	pitchpine
COVER CONTENTS:	Pitch Pine habitat polygons
COVER TYPE:	Poly
SOURCE:	DRED Natural Heritage Bureau (NHB) pitch pine habitat
SOURCE SCALE:	30m raster and 1:24,000
SOURCE MEDIA:	digital
COORDINATE SYSTEM:	NH Stateplane feet; horizontal datum NAD83
TILE:	State
AUTOMATED BY:	NH Natural Heritage Bureau
STATUS:	Complete
LAST REVISION:	April 2005; attributes revised April 2006; metadata revised July 2006

General Description of the Data

- Development of this coverage provides general pitch 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.

- Potential pine barrens habitat was mapped using known pine barrens occurrences (New Hampshire Natural Heritage Bureau 2005). Six variables were measured for pixels within known occurrences: elevation, slope, landcover, drainage, texture, and a composite index of drainage and texture indicating the location of the pixel relative to large, contiguous areas of appropriate soils conducive to fire spread. For each variable, the range of values that encompassed 85-93% (depending on the variable) of the pixels was selected. Throughout the state, pixels that fell within these value ranges for all six variables were selected as potential pine barrens habitat. Known habitat patches as well as historically known patches were then added to the map.

- The pine barrens map was heavily dependent on the accuracy of soils data and elevation data. While there are some errors in the elevation data, there are likely to be more errors in the soils data. County soil surveys often do not show small inclusions of different soil types within larger polygons. In addition, digital county soil surveys are not available for Belknap and Merrimack Counties or the White Mountains, and drainage and texture data is absent from some polygons of Coos County. For these areas, the STATSGO data set was used (Natural Resources Conservation Service 1994). STATSGO is a map of soil data at a much coarser scale than county soil surveys, and thus is much more prone to error at the fine scales required for accurate habitat maps. Thus, the pine barrens map will be most inaccurate in these areas.

- Information on pine barrens distribution and status was collected from habitat management plans, technical field reports, agency data, and scientific journals.

Item definitions for PITCH_PINE_ALL Polygon attributes

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
ID	2	I	0	sequential ID number
FGID	4	I	0	Unique ID number assigned by NHFGD
CATEGORY	16	C	0	status of habitat (**historic, known, predicted**)
ACRES	16	F	3	area (acres)
AREA_HA	16	F	3	area (hectares)

Item definitions for PITCH_PINE_ALL Polygon attributes (continued):

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
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 of polygon
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
UNIT	50	C	0	conservation planning unit to which polygon is assigned
DSLVHA	8	N	2	Total contiguous area (hectares)
AREA_M2	8	N	1	Area (square meters)
PERIM_M	8	N	1	Perimeter (meters)
NEARDIST	8	I	0	Distance to nearest neighbor (meters)
SHAPEINDEX	5	N	1	Shape index (1= square)
UNFRAGAC	8	N	1	Unfragmented acres (NHFGD coarse filter habitat analysis)
UNFRAGHA	8	N	1	Unfragmented hectares (NHFGD coarse filter analysis)
UNFRAGPCT	5	N	1	Percent unfragmented (NHFGD coarse filter analysis)
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)
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)

Item definitions for PITCH_PINE_ALL Polygon attributes (continued):

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
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)
CONSHA	8	N	1	Area in conservation (hectares)
CONS_PCT	5	N	1	Percent in conservation
GAP123HA	8	N	1	Area in conservation GAP management status 1, 2 or 3
GAP123PCT	5	N	1	Percent in conservation GAP mgt status 1, 2 or 3
BUILDHA	8	N	2	Buildable area/generalized statewide buildout (hectares)
BUILDPCT	5	N	1	Percent buildable
POP90X00	8	I	0	Change in population 1990 to 2000
POPDENSX	8	I	0	Change in population density 1990 to 2000
POP00SQMI	8	I	0	Population density in 2000 (persons per square mile)
HU00SQMI	8	I	0	Housing units density in 2000 (houses per square mile)
ECOSUB	40	C	0	Ecoregional subsection

The NHB pitch pine coverage contained numerous “slivers”, or areas of slight overlap, between pitch pine habitat polygons, making condition assessment unreasonable on the original data, therefore NH Fish and Game Department selected NHB pitch pine polygons classified as current or predicted and dissolved their internal boundaries. Below is the list of condition attributes calculated for those areas.

Item definitions for PITCH_PINE_DSLV polygon attributes:

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
DSLVID	3	I	0	a unique sequential ID number
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)
CURRENT	8	N	2	Area classified by NHB as current pine barrens habitat
CURRENTPCT	5	N	1	Percent of area classified by NHB as current pine barrens
PREDICTED	8	N	2	Area classified by NHB as predicted pine barrens habitat
PRED_PCT	5	N	2	Percent of area classified by NHB as current pine barrens
DOTROADKM	8	N	2	Kilometers of all NHDOT roads within the unit
DENSROADS	5	N	2	Road density in the unit (km/km2)
DOTMAJORKM	8	N	2	Km of all DOT State and Town roads
DENSMAJOR	5	N	2	Density of State and Town roads (km/km2)
DISTROUTE	8	I	0	Distance to nearest route (meters)
DOTMINORKM	8	N	2	Km of gravel and unmaintained roads, plus private roads
DENSMINOR	5	N	2	Density of minor roads (km/km2)
DISTROAD	8	I	0	Distance to nearest road (meters)
CONSHA	8	N	2	Area in conservation/public land (hectares)
CONS_PCT	5	N	1	Percent in conservation/public (%)
GAP123HA	8	N	2	Area in conservation GAP management status 1, 2 or 3
GAP123PCT	5	N	1	Percent in conservation GAP mgt status 1, 2 or 3
BUILDHA	8	N	2	Developable land – generalized buildout (hectares)
BUILDPCT	5	N	1	Percent land area that is developable
POP90X00	8	I	0	Change in population 1990 to 2000
POPDENSX	8	I	0	Change in population density 1990 to 2000
POP00SQMI	8	I	0	Population density in 2000 (persons per square mile)
HU00SQMI	8	I	0	Housing units density in 2000 (houses per square mile)
ELU30VAR	3	I	0	Variety of Ecological Land Units (ELU30 = elevation, substrate, landform)
IFESMEAN	2	I	0	Mean IFES score (Integrated Fragmentation Effects Surface The Nature Conservancy; Zankel, 2005)

Item definitions for PITCH_PINE_DSLV polygon attributes: (continued)

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
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_DLSVID	4	I	0	ID of nearest neighbor
SHAPEINDEX	5	N	1	Shape index
PROXINDEX	8	N	2	Proximity index
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)
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
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P_SHAN_BUF	3	N	3	Shannon diversity index of rare plant source features within 1km of polygon
P_COND_BUF	2	C	0	Average rank of rare plant source features within 1km of polygon
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P_RICH_POL	3	I	0	Species richness of rare plants in polygon
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C_COND_BUF	2	C	0	Average rank of rare and exemplary natural community source features within 1km of polygon
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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
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)

Item definitions for PITCH_PINE_DSLV polygon attributes: (continued)

ITEM NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
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

NOTES

BIO1 Condition score = ($A\_RICH\_BUFF_R$*.2) + ($A\_RICH\_POL_R$*.2) + ($P\_RICH\_POL_R$*.2) + ($C\_RICH\_POL_R$*.2) + ($CURR\_PCT_R$*.2)
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 = ($IFESMEAN_R$*.25) + ($POP00SQMI_R$*.25) + ($HU00SQMI_R$*.25) + ($CAINDEX_R$*.25)
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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