New Hampshire Fish and Game Department
Spatial Data Notes

DATA LAYER:	Threat/condition attributes for peatlands complexes
COVER NAME:	Peatlands
COVER TYPE:	Polygon
COORDINATE SYSTEM:	NH Stateplane feet; horizontal datum NAD83
TILE:	State
AUTOMATED BY:	NH Fish & Game Dept. (NH Natural Heritage Bureau criteria)
STATUS:	Complete
LAST REVISION:	December 2024

General Description of the Data

- Development of this coverage was completed for incorporation into the 2025 New Hampshire State Wildlife Action Plan. Funding for the Plan was provided by the U.S. Fish & Wildlife Service.

- Potential peatlands were mapped by system, outlined below, following methods developed by NH Natural Heritage Bureau. For all systems, any wetlands adjacent to an NWI lake, or a major river from NHD hydrography, were excluded.

- *Black spruce peat swamp:* The two forested systems in this habitat are the black spruce peat swamp and temperate peat swamp. Analysis of NHB black spruce peat swamp element occurrences showed that NWI categories nearly always had a primary vegetation class of FO4 mixed with SS or another FO. Water regimes were always E. Thus, all NWI wetlands with these characteristics were selected and grouped into contiguous polygons. The black spruce peat swamp system does not typically have an inlet, nor is it adjacent to lakes or ponds, so any of these grouped polygons that abutted an NWI lake were deleted, as well as those which had more than one intersection with streams (multiple stream intersections indicate both an inlet and an outlet).

- *Temperate peat swamp:* The same analyses were performed for the temperate peat swamp, except that vegetation classes of FO1/FO4, FO1/SS3, and FO1/SS4 were used, based on the vegetation description in Sperduto 2004. Since this system only occurs in central and southern New Hampshire, wetlands in the White Mountains, Vermont Piedmont, Mahoosic-Rangely, and Connecticut Lakes ecoregion subsections were excluded.

- *Kettlehole bog:* Of 24 NHB kettlehole bog element occurrences, 17 had SS3 as one of the vegetation types. Thus, for kettlehole bogs, all wetlands with SS3 in combination with any other vegetation category, and which had hydrologic regimes of B, C, or E (D. Sperduto, pers. comm.) were selected. To be sure that any adjacent, incorrectly classed NWI wetlands were also included, other primarily SS wetlands with B,C, or E hydrologies that were adjacent to the selected SS3 wetlands were added to the set. Wetland groups from the black spruce peat and temperate peat systems were also added if they intersected the potential kettlehole bog wetlands, since kettlehole bogs often have lagg zones with the same communities as these two systems (Sperduto 2004). Adjacent wetlands were grouped, and as with the previous two systems, kettlehole bogs do not have an inlet and are not adjacent to lakes, so groups of wetlands intersecting more than one stream, or adjacent to an NWI lake, were excluded.

- Because kettlehole bogs often have open water and peat mats in the center, wetlands with any combination of vegetation codes UB, AB, and EM (the latter could be an incorrectly classed peat mat), and hydrologic regimes of H or F, were added if they were completely surrounded by suitable kettlehole bog wetlands. In addition, any other small SS, FO, or EM wetlands that were completely surrounded by the potential kettlehole wetlands were added so there would be no holes in the bogs.

- These potential kettlehole bogs were then analyzed based on landscape position and size. Any kettlehole bog groups of more than 20 acres in size were removed (Sperduto 2004). Kettlehole bog groups that were part of a larger wetland complex of more than 20 acres were also excluded. Finally, because NHB kettlehole bog element occurrences were usually isolated from other wetlands with the exception of some that were adjacent to forested wetlands, any potential kettlehole groups that intersected other non-forested wetlands were removed.

- Finally, individual NWI wetlands that had been classed as both kettlehole bogs and either black spruce peat swamp or temperate peat swamp were analyzed visually and assigned to only one of the categories based on whether the forested wetland created an outer ring around the other kettlehole bog wetlands (in which case it was assigned to the kettlehole bog system) or whether it projected out to the side (in which case it was assigned to the appropriate forested system). Note that any forested peatland system wetlands that had been removed from the kettlehole bog system in earlier analyses were *not* removed from their original forested peatland system.

- *Coastal conifer peat swamp:* All NWI wetlands with a vegetation class dominated by FO4 and a hydrologic regime of B,C, or E were selected (Sperduto 2004, D. Sperduto pers. comm.). Because this system does not have an emergent or open water component, only combinations including FO and SS were included. It is extremely likely that all of the inland coastal conifer peat swamp systems have been discovered, so for this map of predicted wetlands, only those within the two coastal subsections (Gulf of Maine Costal Plain and Gulf of Maine Coastal Lowland) were included. Any wetland that overlapped a previously predicted black spruce peat swamp wetland was classed as potentially being either of these two systems.

- *Northern white cedar minerotrophic swamp:* All NWI wetlands with a vegetation class dominated by FO4 and a hydrologic regime of B,C, or E were selected (Sperduto 2004, D. Sperduto pers. comm.). Wetlands for this system were restricted to the two northernmost ecoregion subsections (Mahoosic-Rangeley and Connecticut Lakes).

- *Medium level fen and other peatlands:* For remaining peatlands, all other wetlands with any vegetation class including SS2, SS3, or SS4 with hydrologic regime of B, C, or E were selected. Added to this set were wetlands with a dominant vegetation class of any SS category, as well as EM, EM1, and any EM/SS combination, with B,C, or E hydrology, and which intersected the initial set. This last selection was based on the numerous NWI wetlands of “non-peat” classes that occurred along the margins of many peatland EO’s, some of which may be misclassified in the NWI and which in reality are peatlands.

- From this selection, wetland groups with more than one stream intersection (indicating an inlet as well as an outlet) were designated as medium-level fen systems, since this is the only peatland system that can have a definable inlet (Sperduto 2004). Other peatlands located over 2500 feet in elevation were classed as “Alpine/subalpine bog system or montane sloping fen system” (USGS 2001). All others were classed as “System Unknown.”

Wetland Complexes

Wetlands were assessed in part as part of wetland complexes. Wetland complexes were created by grouping all freshwater wetlands that occurred within a 250-meter separation distance or less. Polygons from all wetland habitat types (marsh, peatlands, temperate swamps, northern swamps, and floodplain forests) were merged and then buffered by 125 meters to create preliminary groupings. The buffer areas were then split by major routes in the NH Dept. of Transportation road network, so that nearby wetlands occurring on opposite sides of a highway would be assigned to different wetland complexes.

Potential Errors in the Data

The National Wetlands Inventory can underpredict peatlands (NH NHB). An attempt was made to account

for this error by including other non-peatland NWI types adjacent to peatland types, but this may not offset all the error, and it may also introduce new errors of overprediction. Any spatial errors in the NWI and hydrography data could result in erroneous analyses of adjacency to streams, rivers and lakes, which could result in the elimination of some wetlands that should actually be considered peatlands, or the inclusion of wetlands that should not be considered peatlands. Classification of wetlands into specific systems could contain error based on the general nature of NWI classes and the lack of more detailed information to aid in the classification.

Item Definitions for WETLANDS_250COMPLEX polygon attributes:

ITEM NAME	DESCRIPTION
ID250	Sequential number assigned to buffer polygons
ACRES	Total area of the peatland complex (acres)
AREA_HA	Total area of the peatland complex (hectares)
A_RICH_BUF	Species richness of rare animals within their dispersal distances (NH NHB 2004-2024)
A_RICH_POL	Species richness of rare animals within polygon (NH NHB 2004-2024)
P_RICH_POL	Species richness of rare plants in polygon (NH NHB 2004-2024)
C_RICH_POL	Richness of natural communities in polygon (NH NHB 2004-2024)
LGWETHA	Area of largest wetland in the complex
NUM_WET	Number of wetland polygons in the complex
VEG_RICH	Number of dominant NWI vegetation classes in the complex (USFWS 2024)
LCONN	Local Connectedness (TNC metric developed by UMass-DSL, Oct. 2021)
LCMPLX	Landscape Complexity (TNC metric developed by UMass-DSL, Oct. 2021)
IEI	Index of Ecological Integrity (TNC metric developed by UMass-DSL, Oct. 2021)
ROADDENS	Road density within 250m of the complex (NHDOT 2024)
DISTROAD	Distance to nearest road (meters) (NHDOT 2024)
DESEI_WQ	Landscape Level Wetlands Assessment score Water Quality degradation (NHDES 2020)
DESEI_HU	Landscape Level Wetlands Assessment score Human Activity (NHDES 2020)
IMPOUND	Percent impounded (floodplain forest habitat only) (NHDES 2022)
DISTDAM	Distance (meters) to nearest active dam (floodplain forest habitat only) (NHDES 2022)
ECOREGION	Ecoregional subsection
WSGROUP	Watershed Group (single character ID; TNC classification)
WSGNAME	Watershed Group name (TNC classification)
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)
CONDITION	WAP Priority based on statewide and regional condition score
PRIORITY	WAP Priority based on COND score and EO add-ins
CONS_AC	Area in conservation (acres)
CONS_PCT	Percent in conservation

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 denotes percentile rank, thus “good” sites score high (maximum percentile rank=100) and “poor” sites score low (minimum percentile rank=0).

LAND Condition score = ($HECTARES_R$*0.5) + (WET_250M_R*0.5)
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 score = (IFESMEAN$_R$*.34) + (NATURAL$_R$*.33) + (DIST_HUM$_R$*.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 The condition index = (BIO+LAND+HUMAN)/3 as defined above

NOTES:

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

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.

DATA SOURCES:

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