NORTHEASTERN TERRESTRIAL WILDLIFE HABITAT CLASSIFICATION

The Northeast Habitat Classification and Mapping Project

NatureServe
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NEAFWA

a report to the Virginia Department of Game and Inland Fisheries
on behalf of the Northeast Association of Fish and Wildlife Agencies
and the National Fish and Wildlife Foundation

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cover photos clockwise from top left:
Northern Atlantic Coastal Plain Dune and Maritime Grassland habitat, Cape Cod National Seashore, Massachusetts (photo L. Sneddon);
Acadian-Appalachian Subalpine Woodland and Heath-Krummholz habitat, Borestone Mountain, Maine (photo S. Gawler);
Ruderal Upland – Old Field habitat, Belgrade, Maine (photo S. Gawler);
Central Appalachian Dry Oak-Pine Forest habitat, Delaware Water Gap National Recreation Area, Pennsylvania (photo Pennsylvania Natural Heritage Program).

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Introduction

What is habitat?

Habitat is a broad term. Generally, it means the environment – physical and biological – that provides the necessary food, shelter, and other needs of a particular organism. It usually refers to species or groups of species, rather than individual animals or plants. For the Northeast Terrestrial Habitat Classification system (NETHCS), we are using ecological cover types based on vegetation, with the option of added finer-scale characteristics, to define types that can then be used to represent habitat for one or more wildlife species. Terrestrial habitats, for this work, are all upland habitats, and wetland habitats exclusive of the aquatic habitats of rivers and lakes; estuarine habitats are included but marine habitats are not.

The issue of scale is an important consideration in developing any habitat classification, but is particularly relevant to a regional classification. Individual animals that make up species populations are mostly responding to very local conditions – a particular type of tree canopy cover, or the availability of standing deadwood, or a litter layer, or the presence of surface water for a certain period, or any of a myriad of other factors. But a regional map cannot represent such fine-scale detail. Instead, we are adopting the widely used convention sometimes referred to as the "coarse filter", in which more broadly defined habitats or community types represent habitat for more than one species (Chadwick 2007, USFWS 2006). Many of these habitats can be mapped at a regional scale, facilitating interstate approaches to wildlife conservation. The coarse filter approach can then be supplemented on a local basis by a "fine filter" approach for species-specific needs not otherwise addressed.

Ecological Systems

Ecological systems developed by NatureServe were chosen as the basic classification scale for this project. Ecological systems are defined as "recurring groups of biological communities that are found in similar physical environments and are influenced by similar dynamic ecological processes, such as fire or flooding. They are intended to provide a classification unit that is readily mappable, often from remote imagery, and readily identifiable by conservation and resource managers in the field." (Comer et al. 2003). They are defined based on biogeographic region, landscape scale, dominant cover type, and disturbance regime. Examples in the Northeast include Central Appalachian Dry Oak-Pine Forest, Northern Appalachian - Acadian Acidic Swamp, Northern Atlantic Coastal Plain Sandy Beach, and Appalachian Shale Barrens.

Ecological systems are vegetation-based and are tied to, while not part of, the US National Vegetation Classification (USNVC) (FGDC 2008). Each ecological system is described as a collection of USNVC associations that occur together in some combination on the ground. Associations are relatively fine-scale mapping units that can be very useful in characterizing a specific area and driving

local management decisions, but are often not amenable to mapping at a regional scale, or mapping relying on remote data. The USNVC is a hierarchical classification, and the upper levels of the hierarchy (Macrogroup and above) have been appropriated as a way of organizing ecological systems. The task of linking systems to both Groups and Macrogroups is still being completed nationwide as part of LANDFIRE's support for the USNVC partnership; this project uses the draft linkage for the northeastern systems (Appendix B).

The names of ecological systems incorporate a biogeographic reference, and the ecological systems classification for the continental U.S. used major geographic divisions as an upper-scale descriptor (Comer et al 2003). They were adapted from Bailey's (1995 and 1998) Divisions, with division lines modified according to ecoregion lines developed by The Nature Conservancy (Groves et al. 2002) and World Wildlife Fund (Olson et al. 2001). These Divisions (Fig. 1) are sub-continental landscapes reflecting similar climate and biogeography. Three Divisions cover the northeast: Laurentian-Acadian (Div. 201), Central Interior and Appalachian (Div. 202), and Gulf and Atlantic Coastal Plain (Div. 203). Each ecological system has a "home" division with which it is most closely allied ecologically, and the NETHCS uses the three divisions as one of the grouping variables. An ecological system name may use its "home" Division in its name (e.g. Laurentian – Acadian) or, depending on the system range, a narrower biogeographic reference such as "Central Appalachian" (part of Division 202). In some cases, these narrower references are drawn from the ecoregions used by The Nature Conservancy in its conservation planning (Groves et al. 2002, Fig. 2).

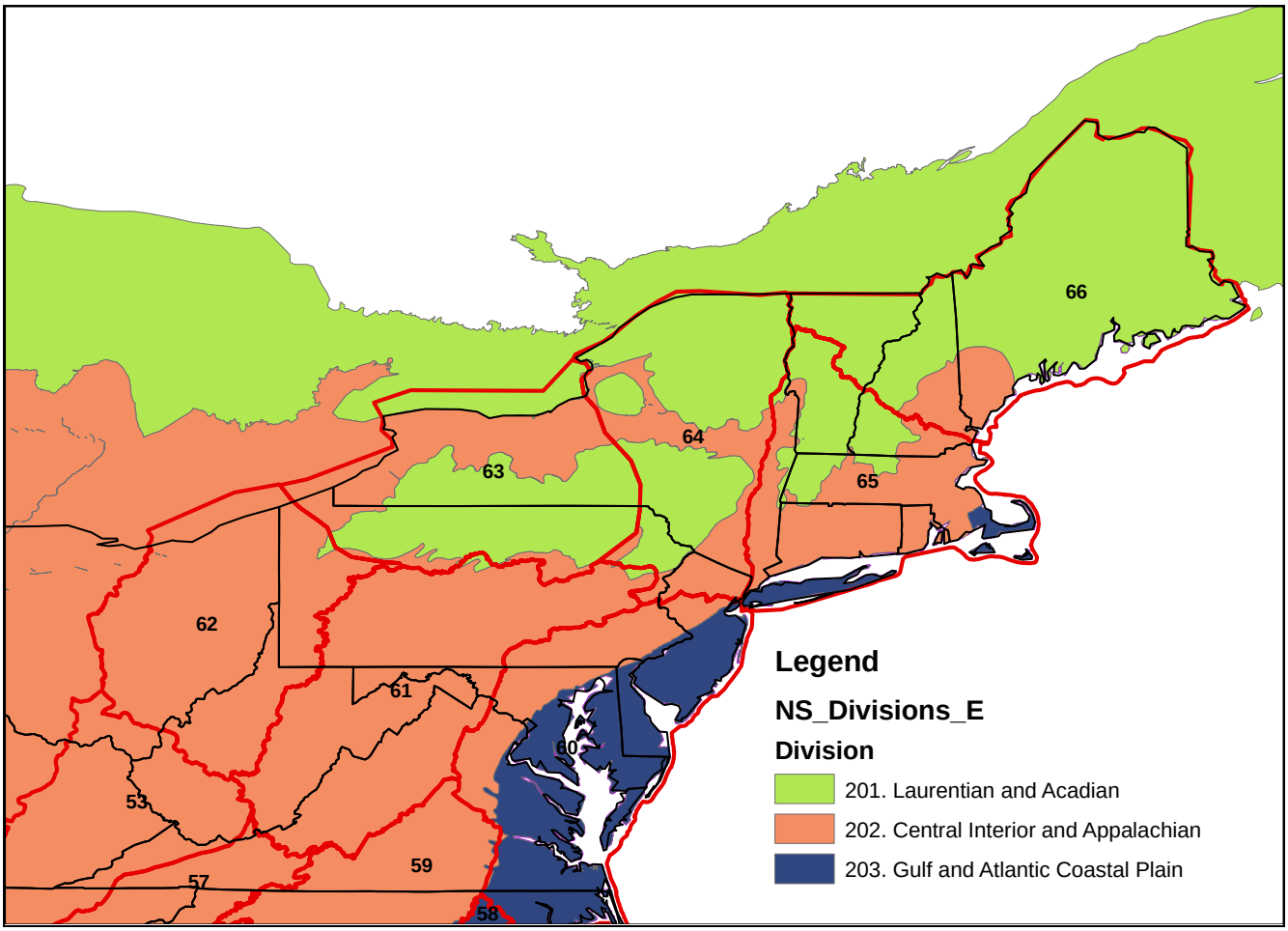

Figure 1. Biogeographic Divisions used in the classification. Red lines are the MRLC mapzones, used for NLCD, GAP, and LANDFIRE maps, with their numbers (MRLC 2008a).

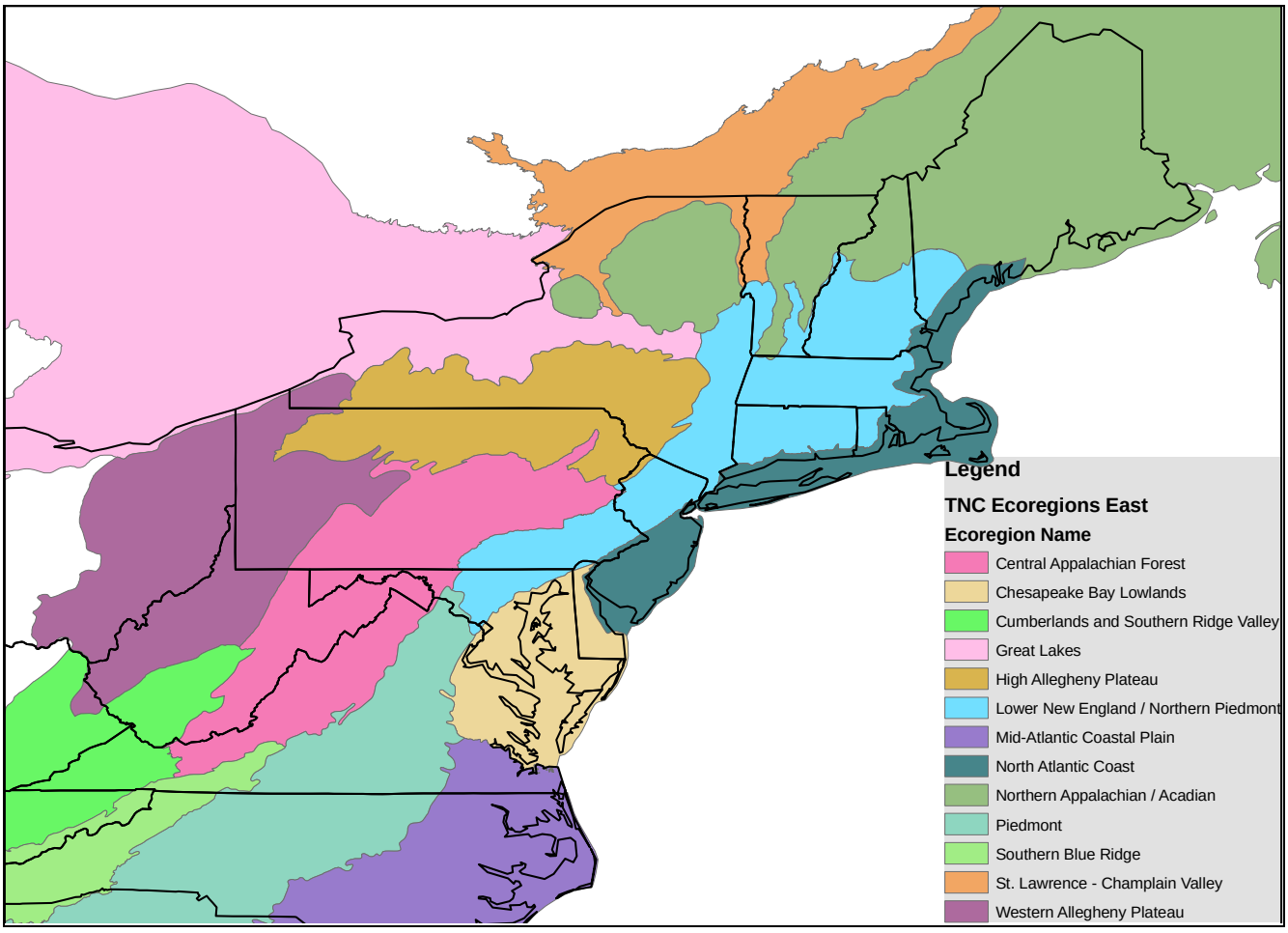

Figure 2. TNC Ecoregions of the Northeast.

Because environmental and disturbance factors occur at many different scales, each ecological system is assigned to one of four landscape patterns: ***matrix*** systems, which define the landscape character of an area, occupying large contiguous areas and typically with wide ecological amplitudes, generally occupying areas of > 2,000 hectares under natural conditions (e.g. Central Appalachian Dry Oak-Pine Forest); ***large patch*** systems, which occupy particular landscape settings and have a narrower ecological amplitude, generally occupying 50-2,000 hectares under natural conditions (e.g. Northern Appalachian - Acadian Acidic Swamp); ***small patch*** systems, occurring under very localized environmental conditions that are distinctly different from the surrounding landscape (e.g. Appalachian Shale Barrens) ; and ***linear*** systems, which occur as long narrow strips, often at the ecotone between terrestrial and aquatic systems (e.g. Northern Atlantic Coastal Plain Sandy Beach).

Integration of LANDFIRE legend

Ecological systems describe portions of the landscape that are natural or near-natural (Comer et al. 2003), i.e., are not drastically changed by human influence. For comprehensive mapping of virtually any region in the United States, ecological systems therefore need to be supplemented by altered and cultural land types such as agricultural lands and developed areas. Comprehensive mapping efforts

underway by LANDFIRE and USGS GAP provide a base mapping legend that combines ecological systems with these other land types, and that approach was followed here. LANDFIRE (www.landfire.gov) is a multi-agency project describing and mapping vegetation, wildland fuel, and fire regimes across the United States. Partners include the USDA Forest Service, U.S. Department of the Interior, and the U.S. Geological Survey, with operations conducted through the USFS Missoula Fire Sciences Laboratory, the USGS Center for Earth Resources Observation and Science, and The Nature Conservancy. NatureServe is a contractor for tools related to ecological systems distribution, characteristics, and dynamics. LANDFIRE grew out of the needs of federal land agencies to develop tools that land managers could use to prioritize areas for hazardous fuel reduction, and the maps and data can be used in prioritizing areas for ecological conservation. LANDFIRE provides science to support the Healthy Forests Restoration Act (Community Wildfire Protection Plans) and the National Fire Plan. The USGS Gap Analysis Program is partnering with LANDFIRE and using LANDFIRE initial products as the base for updating its gap analysis of the Southeast region (completed, and including Virginia) and the Northeast region (being planned).

Terrestrial Habitat Classification Tenets

The following tenets were put forth by the Steering Committee as guidance for the terrestrial habitat classification:

1. ***Habitat classification*** is the logical, repeatable grouping of ecological elements that approximate basic cover and context (space and surroundings) for species across a range of animal taxonomic groups, usually at some broad spatial scale.
2. Basic wildlife habitat is best defined by vegetative community, or land cover when vegetation is lacking or sparse.
3. Because NatureServe's Ecological Systems Classification represents the current state-of-the-art in regional scale natural vegetation community classification, it should serve as the basis for the regional scale level in this terrestrial habitat classification system. However, since the Ecological Systems Classification was not created specifically for terrestrial wildlife habitat and does not put as much emphasis on human impacted/influenced/managed communities, much refinement is needed for our purposes.
4. This wildlife habitat classification is a dynamic system that will and should change as more information about habitat requirements, intended uses, and mapping techniques increase.
5. The creators of this system do not know all of the uses that this system might be put to in the future.
6. Mapping techniques, remote sensing technology, and computing power advance rapidly. Because of this ever-increasing capability, the creators of this system cannot reliably predict what features can and cannot be mapped at any one scale, in the future. The "mappability" of specific habitat types or features needs to be determined within specific individual mapping efforts. We therefore strive to create the most logical and consistent grouping of habitat types, by scale, regardless of current ability to map at any one scale.
7. This system should be applicable at multiple scales from the individual site (several hectares) to entire Northeast region. Because of the regional focus of this particular project, the most detail will be provided at the regional scale initially. The scale of the classification (and map to follow) will not be useful for some species applications (e.g., some species and rare communities) at the within-state level. Each state/jurisdiction is encouraged to develop the lower levels or smaller units of the hierarchy for their own use at the state, county, and site levels.

8. This classification system will focus on broad habitat needs of wildlife species; however, the actual associating of individual wildlife species to units within this classification is beyond the scope of this initial project.

Process

The first draft of the Northeastern Terrestrial Wildlife Habitat Classification (NETHCS) was developed from two directions: first, by assessing habitat types from each state's SWAP, and second, by using the LANDFIRE National Map Legend as the starting point for habitat units.

Categorizing SWAP habitats

USFWS provided a list of habitat types extracted from each states's SWAP. Habitat types used in the SWAPs varied widely throughout the U.S. and in the Northeast as well (Davis et al. 2008). In the Northeast, some states used generalized land-cover types, while others used more detailed community classifications from their natural heritage program, and others used classifications not tied to natural heritage program types, USNVC types, or ecological systems. Further, some states listed individual types; others used a two-level approach with types and subtypes (see box).

Sample: How an upland forest dominated by mature oaks and hickories would be characterized in various SWAPs

CT	Upland Forest	Dry Oak Forests
DC	Hardwood Forest	Mixed oak-beech forests
DC		Chestnut oak forests
MA	Upland Forest	
MD	Dry Oak-Pine Forests	
ME	Deciduous and Mixed Forest	
NH	Appalachian Oak Pine Forest	
NJ	Upland forests	deciduous forest
NY	Terrestrial Forested	
PA	Deciduous/Mixed Forest (upland)	
RI	Deciduous Forests	Oak-Hickory
RI		Oak/Heath
VA	Forest Habitat	Deciduous Forest
VT	Oak-Pine-Northern Hardwood Forest	Dry Oak Forest
VT		Dry Oak-Hickory-Hophornbeam Forest
VT		White Pine-Red Oak-Black Oak Forest
WV	Oak/Hickory and Dry/Mesic Oak Forest	
WV	Oak/Heath and Oak/White Pine Forests	
WV	Hill Country Deciduous Forests	

Types and subtypes were standardized to lists of habitat units for each state (see box).

Sample: SWAP habitat types and subtypes standardized to SWAP habitat units for NETHCS

CT	Upland Forest - Dry Oak Forests
DC	Hardwood Forest - Mixed oak-beech forests
DC	Hardwood Forest - Chestnut oak forests
MA	Upland Forest
MD	Dry Oak-Pine Forests
ME	Deciduous and Mixed Forest

etc.

Each state habitat unit was classed as Terrestrial or Aquatic, and only the Terrestrial units were used for this classification. For sorting, those units were further categorized as Open or Wooded, as Upland or Wetland, and as Natural/near-natural, Cultivated/Managed, or Early Successional. The number of units in any on state ranged from 12 to 90 (Table 1); the smallest states tended to divide their habitats more finely (Fig. 3). It was apparent that a regional classification at the scale of ecological systems would be intermediate between the more finely cut (e.g. Vermont, Delaware) and the more coarse (e.g. Pennsylvania, New York) state categorizations.

Table 1. SWAP Habitat Units per state, ordered by fewest to greatest.

State	Number of SWAP habitat units	Area (SqMi)	N habitats per 100,000 sqmi
Virginia	12	40598	30
District of Columbia	18	61	29508
Pennsylvania	19	45310	42
Maine	20	33128	60
West Virginia	25	24231	103
New Jersey	26	7790	334
New Hampshire	30	9283	323
Massachusetts	35	8262	424
Maryland	37	10455	354
New York	40	49112	81
Connecticut	44	5006	879
Rhode Island	64	1213	5276
Delaware	73	2026	3603
Vermont	90	9615	936

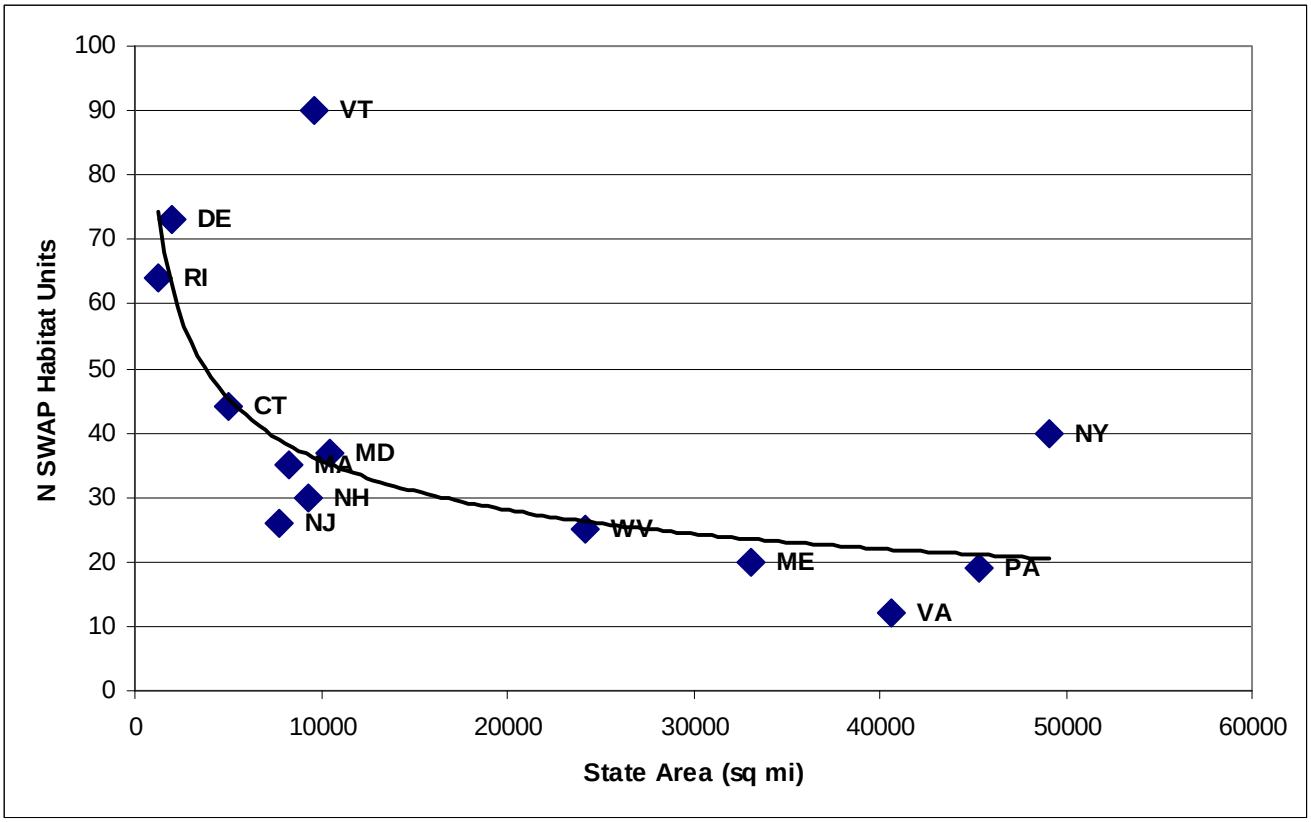

Figure 3. Relationship of state area to number of SWAP habitat types.
Trendline, for illustration purposes only, calculated using Excel power function.

First Draft Regional Classification

The existing LANDFIRE/GAP national legend, filtered for the region, was used as the starting point (Table 2). This structure is based on NatureServe's Ecological Systems, and expanded to include altered and cultural land types not currently covered by, or under-represented in, the Ecological Systems classification. The cultural and highly altered types, based on land cover, were condensed somewhat to make them more workable for the Northeast. The LANDFIRE/GAP national legend excludes small-patch ecological systems, and aggregates most wetland systems (and sparsely vegetated systems, minor in the Northeast) into larger composite units.

A hierarchical element to the classification was desired so it could be scaled to different applications, and so that the classification would include a set of classes that everyone can relate to, given that different states used very different levels of detail. For this draft, the entire legend was reviewed to group the basic units into broader habitat classes that were compatible with LANDFIRE legend units but also reflected broad-scale habitat types. This ad-hoc set of 25 habitat groups (Table 3) was linked to the 2007 pilot set of Formation level units of the USNVC standard (FGDC 2008; details of the process at http://www.fgdc.gov/standards/projects/FGDC-standards-projects/vegetation/).

Table 2. LANDFIRE legend for the northeastern states as of July 2007.

LANDFIRE July 2007 legend unit	LANDFIRE code	Ecological Systems code
LAND USE OR UNVEGETATED SURFACES		
Developed-General	20	
Developed-Open Space	21	
Developed-Low Intensity	22	
Developed-Medium Intensity	23	
Developed-High Intensity	24	
Quarries/Strip Mines/Gravel Pits	32	
Agriculture-General	80	
Agriculture-Pasture/Hay	81	
Agriculture-Cultivated Crops and Irrigated Agriculture	82	
Agriculture- Urban/Recreational Grasses	84	
SEMI-NATURAL / ALTERED VEGETATION		
Ruderal Vegetation		
Ruderal Upland - Old Field	8301	
Ruderal Forest - Northern and Central Hardwood and Conifer	8303	
Ruderal Wetland	8306	
Introduced Vegetation		
Introduced Upland Vegetation - Treed	8401	
Introduced Upland Vegetation - Shrub	8402	
Introduced Upland Vegetation - Annual and Biennial Forbland	8403	
Introduced Upland Vegetation - Annual Grassland	8405	
Introduced Upland Vegetation - Perennial Grassland and Forbland	8404	
Introduced Riparian Vegetation	8410	
Introduced Wetland Vegetation - Mixed	8411	
Recently Burned Vegetation		
Recently Burned Forest and Woodland - Low Severity	8507	
Recently Burned Forest and Woodland - Moderate Severity	8505	
Recently Burned Forest and Woodland - High Severity	8502	
Recently Burned Shrubland	8503	
Recently Burned Grassland	8504	
Modified/Managed Vegetation		
Recently Logged Timberland - Herbaceous Cover	8508	
Recently Logged Timberland - Shrubland Cover	8509	
Recently Logged Timberland - Woodland Cover	8510	
Managed Tree Plantation - Northern and Central Hardwood and Conifer Plantation Group	8513	
Modified/Managed Wetland Vegetation	8511	
NATURAL/NEAR NATURAL LAND COVER		
UPLAND FOREST AND WOODLAND	4	
Deciduous Forest and Woodland	41	
Laurentian-Acadian Northern Hardwoods Forest	4108	CES201.564
Northeastern Interior Dry-Mesic Oak Forest	4109	CES202.592
Southern Appalachian Northern Hardwood Forest	4115	CES202.029
North-Central Interior Beech-Maple Forest	4119	CES202.693
Southern Appalachian Oak Forest	4121	CES202.886
Southern Piedmont Mesic Forest	4122	CES202.342
Allegheny-Cumberland Dry Oak Forest and Woodland	4123	CES202.359
Southern and Central Appalachian Cove Forest	4124	CES202.373
Central and Southern Appalachian Montane Oak Forest	4126	CES202.596

South-Central Interior Mesophytic Forest	4127	CES202.887
Northern Atlantic Coastal Plain Dry Hardwood Forest	4130	CES203.475
Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest	4141	CES203.241
Appalachian Shale Barrens	4147	CES202.598
Piedmont Hardpan Woodland and Forest	4149	CES202.268
Atlantic Coastal Plain Mesic Hardwood Forest	4150	CES203.242
Evergreen Forest and Woodland	42	
Atlantic Coastal Plain Upland Longleaf Pine Woodland	4250	CES203.281
Central and Southern Appalachian Spruce-Fir Forest	4253	CES202.028
Southern Appalachian Montane Pine Forest and Woodland	4255	CES202.331
North-Central Appalachian Pine Barrens	4257	CES202.590
Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	CES203.269
Central Atlantic Coastal Plain Maritime Forest	4264	CES203.261
Laurentian-Acadian Northern Pine-(Oak) Forest	4265	CES201.719
Mixed Deciduous and Evergreen Forest and Woodland	43	
Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	CES201.563
Southern Piedmont Dry Oak-(Pine) Forest	4311	CES202.339
Central Appalachian Dry Oak-Pine Forest	4312	CES202.591
Appalachian (Hemlock)-Northern Hardwood Forest	4313	CES202.593
Acadian Low-Elevation Spruce-Fir-Hardwood Forest	4316	CES201.565
Acadian-Appalachian Montane Spruce-Fir-Hardwood Forest	4317	CES201.566
Appalachian Serpentine Woodland	4318	CES202.347
Central Appalachian Pine-Oak Rocky Woodland	4320	CES202.600
Northern Atlantic Coastal Plain Maritime Forest	4322	CES203.302
UPLAND SHRUBLAND	5	
Dwarf-shrubland (<.5 m height)	**51**	
Acadian-Appalachian Alpine Barrens	5210	CES201.567
Short Shrubland (.5-2 m in height)	52	
Tall Shrubland (>2 m in height)	53	
Acadian-Appalachian Subalpine Woodland and Barrens	5320	CES201.568
UPLAND SAVANNA AND SHRUB-STEPPE		
Savanna	4	
Central Appalachian Alkaline Glade and Woodland	5416	CES202.602
Shrub-steppe	5	
Great Lakes Alvar	5458	CES201.721
UPLAND GRASSLANDS AND HERBACEOUS	3	
Southern Appalachian Grass and Shrub Bald	7127	CES202.294
Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	CES203.264
WOODY WETLANDS AND RIPARIAN	**91**	
Individual Systems		
Eastern Boreal Floodplain	9113	CES103.588
Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoods	9118	CES203.265
Atlantic Coastal Plain Peatland Pocosin and Canebrake	9121	CES203.267
Northern Atlantic Coastal Plain Pitch Pine Lowland	9125	CES203.374
Acadian Near-Boreal Spruce Barrens	9133	CES201.561
Acadian Near-Boreal Spruce Flat	9134	CES201.562
Great Lakes Dune and Swale	9135	CES201.726
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	9137	CES203.252
Central Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest	9310	CES203.304
North-Central Interior Wet Flatwoods	9186	CES202.700
Aggregations of Systems		
Central Interior and Appalachian Floodplain Systems	9140	CES202.627

Central Interior and Appalachian Riparian Systems	9141	CES202.628
Gulf and Atlantic Coastal Plain Floodplain Systems	9142	CES203.629
Gulf and Atlantic Coastal Plain Small Stream Riparian Systems	9143	CES203.630
Laurentian-Acadian Floodplain Systems	9144	CES201.631
Boreal Swamp and Bog Systems	9146	CES103.633
Central Interior and Appalachian Swamp Systems	9148	CES202.635
Gulf and Atlantic Coastal Plain Swamp Systems	9149	CES203.636
Laurentian-Acadian Swamp and Bog Systems	9150	CES201.637
HERBACEOUS WETLANDS	**92**	
Individual Systems		
Southern Coastal Plain Herbaceous Seep and Bog	9404	CES203.078
Atlantic Coastal Plain Sandhill Seep	3187	CES203.253
Aggregations of Systems		
Gulf and Atlantic Coastal Plain Tidal Marsh Systems	9209	CES203.638
Laurentian-Acadian Salt Marsh and Estuary Systems	9210	CES201.639
Great Lakes Coastal Marsh Systems	9211	CES201.640
Central Interior and Appalachian Herbaceous Wetland Systems	9212	CES202.641
Laurentian-Acadian Shrub-Herbaceous Wetland Systems	9215	CES201.642
BARREN / SPARSELY VEGETATED	31	
Central Interior and Appalachian Sparsely Vegetated Systems	3110	CES202.645
Gulf and Atlantic Coastal Plain Sparsely Vegetated Systems	3111	CES203.646
Laurentian-Acadian Sparsely Vegetated Systems	3112	CES201.647

Table 3. Higher-level habitat groupings in the August 2007 draft.

Formation (FGDC 2008, pilot)	NETHCS habitat group
1.C.1. Warm Temperate Forest	pine-type forests (longleaf)
1.C.2. Cool Temperate Forest	early successional forests
	forest plantations
	hemlock-type forests
	mesic hardwood-type forests
	non-native forests (not plantations)
	oak-type forests
	open woodlands
	pine-type forests
1.C.3. Temperate Flooded & Swamp Forest	floodplains & rivershores
	swamps
1.D.1. Lowland & Montane Boreal Forest	spruce-fir-type forests
1.D.2. Boreal Flooded & Swamp Forest	wooded peatlands
2.C.1. Temperate Grassland, Meadow & Shrubland	beaches and dunes
	grasslands & open meadows
	upland successional shrublands
2.C.4. Temperate & Boreal Bog & Fen	open peatlands
2.C.5. Temperate & Boreal Freshwater Marsh	freshwater marshes, pondshores, and wet meadows
	non-native & managed wetlands
2.C.6. Salt Marsh	estuaries & tidal marshes
4.B.1. Alpine Scrub, Forb Meadow & Grassland	alpine and subalpine
6.B.2. Temperate & Boreal Cliff, Scree, & Rock Vegetation	low-elevation rock outcrops, cliffs & talus
7. Agricultural Vegetation (Agromorphic)	agriculture
8. Developed Vegetation (Hortomorphic)	gravel pits / quarries / open mines
	suburban/semi-developed
	urban

A separate component of this initial draft was cross-referencing the draft NETHCS units to the SWAP habitat units used in each state, to facilitate use by state personnel as well as regional uses.

This draft NETHCS and crosswalk were distributed to the steering committee and partners in each state's wildlife agency and natural heritage program in August 2007. In September 2007, a workshop was held at the National Conservation Training Center in Shepherdstown, West Virginia, along with the meeting of the NEAFWA Wildlife Diversity Technical Committee. The workshop was led by the senior author and steering committee chair, and attended by 20 staff from state Wildlife or DNR agencies, GAP, TNC, and the Western Pennsylvania Conservancy. Nine of the 14 jurisdictions were represented (Appendix C). Staff from the five other states were brought into the process at the next day's Wildlife Diversity Technical Committee meeting.

Workshop participants affirmed the general approach of the NETHCS and identified potential uses:

- A regional context for specific habitat types

- Documenting the distribution of types in neighboring states
- Value for regional planning/funding
- A common language for the region.

Along with the many detailed comments offered, participants suggested and agreed on two major changes to the draft. First, wetland habitats that had been aggregated for LANDFIRE into composite units should be disaggregated to the original ecological systems. Second, small patch ecological systems should be added. The group recognized that many small patch habitats would not be mappable at a regional scale, but agreed that they were important to a complete regional framework given that they represent habitat diversity important to many wildlife species. Because these changes would greatly increase the number of habitat units in the NETHCS, the higher-level structure becomes more important, and it was agreed that the USNVC upper-level hierarchy would be appropriate. The ad-hoc habitat groups used in this draft (Table 3) would be replaced with the Macrogroup level of the USNVC; macrogroups had been drafted for northeastern forests and were in process for non-forested habitats.

Finally, at this meeting, a Terrestrial Working Group (Appendix C) was formed, with representatives from all jurisdictions, to facilitate further review and comment.

A revised draft with these changes was distributed in October 2007 to the steering committee and the Terrestrial Working Group. It presented the classification with two different tabular structures as options. One-paragraph descriptions of each habitat system were included, as well as the distribution by state of each habitat system. Reviewers were asked to comment on the classification units themselves, preferences about organizing the information, and any places where the classification did not adequately represent wildlife habitat.

Revising and Finalizing the NETHCS

The reviews of the October 2007 draft provided a variety of ideas and suggestions, from detailed notes on a particular type to overall comments about the structure of the product. Several themes emerged:

- Reviewers generally felt that this will be a useful effort for broad-scale landscape management and planning.
- Many fine-scale habitats (e.g. for species requiring older forests, or shrub vs. grass cover in reverting fields) are difficult to capture with this draft classification.
- Utility of this classification to SWAP implementation will be easier to assess once we try to apply it to Species of Greatest Conservation Need (SCGN), which is beyond the scope of this project.
- Altered types (e.g. Agricultural and Developed classes) can be very important for wildlife and may need some fine-tuning; for example, Developed classes from the LANDFIRE/GAP legend should be revised to better fit the northeast.
- Mixing ecological systems and land cover classes was problematic for some reviewers; while we acknowledge they are different approaches, they are used together here for the sake of practicality. The general rule is that where the landscape has been so altered that one can't discern the ecological system, one uses the land use/cover categories.
- Organizing the habitat systems by USNVC Macrogroups is workable and provides the needed ability to scale up from individual habitat systems.

The second major revision to the NETHCS was based on these themes. The most pressing issue was deemed to be that of incorporating finer-scale habitat features into the classification without dividing up the habitat systems units beyond the point of utility. An informal survey of how the draft classification might be applied to SGCN species in four states (DE, NY, PA, and VA) indicated that the habitat systems level lacks many of the finer-scale attributes needed to accurately describe habitat for many individual species. For example, Golden-winged Warblers in Pennsylvania can use several habitat systems (Northeastern Interior Pine Barrens, Ruderal Grassland and Shrubland Macrogroup systems, and Quarries/Pits/Stripmines), but only where certain structural conditions are met: (1) open patches of herbaceous vegetation, (2) dense thickets of shrubs, and (3) a forest edge (L. Williams pers. com, 1/8/2008). Some other species are less dependent on additional components to the habitat system: in Delaware, Red Knot and Piping Plover can be attributed to Northern Atlantic Coastal Plain Dune and Maritime Grassland and Northern Atlantic Coastal Plain Sandy Beach, and Bog Turtle to Piedmont Seepage Wetland (R. Coxe, pers com. 1/7/2008).

To address this need, the concept of *structural modifiers* proved useful, i.e., developing a set of relevant attributes that users could add on to the existing habitat systems for particular applications. The resulting classification structure followed the approach used in the Pacific Northwest (Johnson and O'Neil 2001) of separating habitat types from habitat structure and elements. The Oregon-Washington approach used 32 "wildlife-habitat types" as the main classification units (O'Neil and Johnson 2001, Chappell et al. 2001), aggregated from 119 vegetative/land and aquatic/marine cover types derived from the USNVC and other sources. (In scale this roughly parallels the 143 habitat systems in 35 macrogroups in the NETHCS.) They described structural features and habitat elements that can be used to categorize a particular habitat in greater detail (O'Neil et al. 2001b). The NETHCS incorporates structural conditions (and a few other mid-scale habitat elements) as a draft set of *modifiers*, which are defined as habitat attributes relating to vegetation structure, or site-specific characteristics that together constitute variation within a given habitat system. Canopy closure, degree of shrub layer, stand development stage, and presence of standing water are examples of habitat modifiers. Classes for each variable were determined by reviewing similar variables in other classifications and the literature (see, for example, Goodell and Faber-Langendoen 2007 for stand development stages). Under this model, wildlife habitat = habitat system + habitat modifiers. Some habitat modifiers can be mapped using remote data (e.g. canopy closure classes, which correlate to stocking classes used in forestry), but many are site-specific and amenable only to more local mapping approaches. The set of habitat modifiers was drawn from species-habitat notes from various Northeast states, as well as from other efforts such as those in the Pacific Northwest, and is considered a working draft. As this classification is applied to Northeast SCGN, it may be necessary to refine the modifiers.

An additional refinement was to highly altered types. Developed classes (urban/suburban areas) in the LANDFIRE/GAP legend used percent impervious surface (Yang et al. 2003) to distinguish low-intensity, medium-intensity, and high-intensity classes based on the NLCD (MRLC 2008b). Reviewers suggested we reassess the cutoffs to tailor the classes more effectively to the thickly settled Northeast. Specifically, some felt that the percent impervious values for NLCD low-intensity and medium-intensity classes were too high. Review of approaches in different northeastern states revealed that some used percent impervious surface as the class variable while others used average lot size (NJDEP2001, Maine Remote Sensing Committee 2001, Massachusetts Office of GIS 2006, Maryland Office of Planning 1995, and others), and also revealed that much lower cutoffs for percent impervious are used for water quality applications (J. O'Leary, pers. com., R. Bouchard, pers. com., and see http://nemo.uconn.edu/tools/impervious_surfaces/measure/buildout2.htm.) Based on these

concerns, we reconfigured the four NLCD Developed classes into six NETHCS Developed classes (Table 4.)

Table 4. Comparison of Developed classes (exclusive of the Quarries/Pits/Stripmines class, which is the same in both) in NLCD 2001 and the NETHCS. Impervious surface is only one of the factors used to distinguish the classes in the NETHCS.

NLCD 2001	**Impervious**	**NETHCS 2008**	**Impervious**
Developed, high intensity	>80%	Commercial/Industrial	>80%
Developed, medium intensity	50-80%	Residential - High Intensity	50-80%
Developed, low intensity	20-50%	Residential - Medium Intensity	25-50%
		Residential - Low Intensity	15-25%
		Residential - Rural / Sparse	<15%
Developed, open space	<20%	Urban/Recreational Grasses	<20%

The nearly-final draft was distributed to the Steering Committee and the Terrestrial Working Group in April 2008, and presented at the annual NEAFWA meeting on April 29th. Reviews from this version were minor and corrected a few details. An additional task was to update the crosswalk between the NETHCS and each jurisdiction's SWAP habitats.

During the review period, the senior author developed a set of macrogroups for non-forested habitats of the northeast to complement the forested macrogroups developed in an earlier FIA project (Faber-Langendoen and Menard 2006). This organizing structure is shown in Table 5. Formation and Macrogroup names in this classification have been adapted for the Habitat Classification and Mapping Project from the more formal names used in the USNVC. Appendix B cross-references the two sets of names.

Final edits in September 2008 completed the classification.

Northeast Terrestrial Wildlife Habitat Classification System

Structure

The NETHCS is a flexible framework for characterizing wildlife habitat that works on two levels – **habitat systems** and **structural modifiers**. The basic layer is the **habitat system** (blue column in the accompanying excel sheet). These correspond to the *ecological system* units developed by NatureServe, with additional systems for altered habitats and land-use types. The resulting set of 143 habitat systems is congruent with the units being mapped across the northeast for LANDFIRE, and will be coordinated with the approach used in future mapping of the Northeast by the Gap Analysis Program.

The hierarchical organizing system for the habitat systems uses levels from the USNVC hierarchy, which has been accepted as an FGDC standard (Federal Geographic Data Committee 2008,). This hierarchy is based on Formations that are grouped into eight Formation Classes. The Formation level uses very broad categories (e.g., Cool Temperate Forest, which for the NETHCS equals Northeastern Upland Forest)[1]. We added the Macrogroup level as a second grouping variable. Macrogroups are "defined by combinations of moderate sets of diagnostic plant species and diagnostic growth forms that reflect biogeographic differences in composition and sub-continental to regional differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes" (FGDC 2008). The habitat systems are assigned to those 35 macrogroups (yellow column in the accompanying excel sheet). Each Formation contains one or more (generally more) macrogroups, and each macrogroup contains one or more (generally more) habitat systems[2].

The habitat systems are hierarchically arranged by Formation Class, Formation, Macrogroup, and Habitat System. For example, a dry oak-pine forest habitat in Pennsylvania would be:

Forest and Woodland Formation Class (I)
Northeastern Upland Forest Formation (I.C.2)
Central Oak-Pine Forest Macrogroup
Central Appalachian Dry Oak-Pine Forest habitat system

[1] Formation and Macrogroup names in the NETHCS have been simplified from those in the USNVC, which, because of its larger spatial frame, sometimes uses longer or more technical names. A cross-reference between the two sets of names is in Appendix C.

[2] The FGDC standard addresses the National Vegetation Classification, and Ecological Systems technically are not part of that hierarchy. The concept of ecological systems as meso-scale mapping units that can incorporate physiognomic and spatially driven ecological variability requires that they are placed alongside the vegetation hierarchy rather than nest uniformly within it. However, in application we have found that many ecological systems fit more-or-less within a particular macrogroup, and as a matter of utility that approach is followed here.

Table 5. Organizing hierarchy for the NETHCS. The Formations are nested within broad Formation Classes. Formation Class 3 (Semi-Desert) is absent from the NETHCS because it does not occur in the Northeast.

FORMATION		MACROGROUP
FORMATION CLASS 1. FOREST AND WOODLAND		
1.C.1	Southeastern Upland Forest	Longleaf Pine
1.C.2	Northeastern Upland Forest	Southern Oak-Pine
		Central Oak-Pine
		Northern Hardwood & Conifer
		Plantation and Ruderal Forest
		Exotic Upland Forest
1.C.3	Northeastern Wetland Forest	Southern Bottomland Forest
		Coastal Plain Swamp
		Central Hardwood Swamp
		Northeastern Floodplain Forest
		Northern Swamp
1.D.1	Boreal Upland Forest	Boreal Upland Forest
1.D.2	Boreal Wetland Forest	Boreal Forested Peatland
FORMATION CLASS 2. SHRUBLAND AND GRASSLAND		
2.C.1	Grassland and Shrubland	Glade and Savanna
		Outcrop/Summit Scrub
		Lake & River Shore
		Ruderal Shrubland & Grassland
2.C.3	Coastal Scrub-Herb	Coastal Grassland & Shrubland
2.C.4	Peatland	Northern Peatland
		Coastal Plain Peatland
		Central Appalachian Peatland
2.C.5	Freshwater Marsh	Coastal Plain Pond
		Emergent Marsh
		Wet Meadow / Shrub Marsh
		Modified/Managed Wetland
2.C.6	Salt Marsh	Salt Marsh
FORMATION CLASS 4. POLAR AND HIGH MONTANE		
4.B.1	Alpine	Alpine
FORMATION CLASS 5. AQUATIC		
5.A.1	Marine and Estuarine Intertidal (nonvascular)	Intertidal Shore
FORMATION CLASS 6. SPARSELY VEGETATED ROCK		
6.B.2	Cliff & Rock	Cliff and Talus
		Flatrock
		Rocky Coast

FORMATION CLASS 7. AGRICULTURAL		
7	Agricultural	Agricultural
FORMATION CLASS 8. DEVELOPED		
8	Developed	Maintained Grasses and Mixed Cover
		Urban/Suburban Built
		Extractive

Because most habitat systems can incorporate substantial variation in vegetative species dominance, successional stage, and other characteristics that are relevant to wildlife use, the classification superimposes a set of **structural modifiers** that can be applied to any particular area on the landscape to better characterize its habitat values. Structural modifiers (detailed in the accompanying Excel sheet) are outlined in Table 6.

Table 6. Structural modifiers for habitat systems.

Forest Modifiers	Canopy cover (stocking) Evergreen:Deciduous Single vs Multi-story canopy Stand development stage Extent of shrub layer Recently burned
Shrubland Modifiers	% Shrub cover Shrub height Evergreen:Deciduous
Grassland and Herbaceous Modifiers	Closed/open/sparse cover Grass/forb height Scattered small trees
Additional modifiers for wetlands	Salt marsh: low marsh vs high marsh Presence of open water
Other special modifiers	Karst habitats

Wildlife habitat in the NETHCS can thus be characterized by (1) habitat system (or macrogroup), or (2) structural characteristics, or (3) by a combination of the two approaches (Fig. 4).

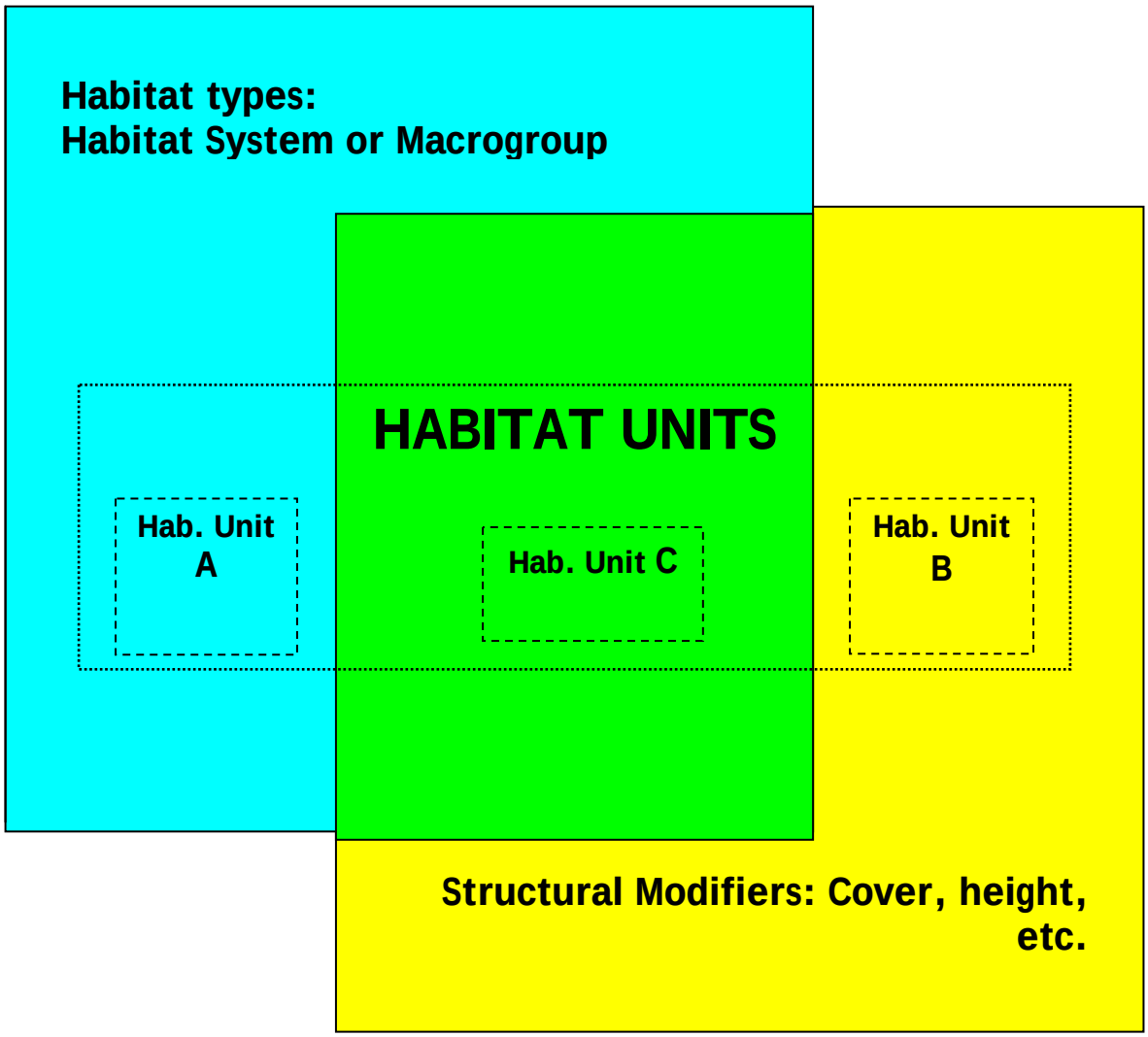

Figure 4. Schematic of the terrestrial habitat classification structure.
Habitat units can be based on habitat system, structural variables, or a combination of the two (see text).

The combination of habitat system with structural modifiers (Fig. 4) provides a powerful tool for assessing habitat.

- Blue (the rectangle that together encloses the blue and green) represents the NETHCS habitat systems and macrogroups. One could assess the extent of Central Appalachian Dry Oak-Pine Forest habitat system across the region as potential habitat for a species guild (see habitat unit "A").
- Yellow (the rectangle that together encloses the yellow and green) represents structural variables and other modifiers; so, for example, at a structural level one could assess an upland shrubland habitat unit or pole-stage deciduous forest habitat unit (see habitat unit "B").
- The green rectangle represents the combination of habitat systems (blue) with structural or other modifiers (yellow), a level often relevant to wildlife management. Habitat for pine warbler, for example, would start with the Laurentian-Acadian Northern Pine-(Oak) Forest habitat system, and given that the birds prefer mature pines for breeding, would then constrain that selection according to developmental stage (mature or older) to arrive at a selection of

habitat units on the landscape that represent potential habitat for pine warbler (see habitat unit "C"). This habitat unit can be represented as ***Laurentian-Acadian Northern Pine-(Oak) Forest [stage: >= mature]***.

The flexibility in this system derives from the various ways users can characterize habitats or (eventually) query a map. As another example, someone interested in habitat for magnolia warbler, which typically nests in young evergreens (particularly spruce), would not necessarily need to deal with habitat type at its finest level, since several coniferous ecological systems could provide breeding habitat, but could instead use the macrogroup level Boreal Upland Forest and then filter that by canopy cover (to select open stands) and/or developmental stage (to select younger stands). This habitat unit (another example of unit "B" in Figure 1) could be represented as ***Boreal Upland Forest Macrogroup [cover: open/partial, stage: <=pole]***.

The combination of Habitat Systems and Structural Modifiers does not encompass all variation in wildlife habitats, but does address much of the variation of interest for a regional classification. At a finer level, one could add lists of habitat elements (*sensu* O'Neil et al. 2001): fine-scale attributes that can determine suitability of a particular area for a particular species or group of species. Examples of habitat elements include coarse or fine woody debris, snags, litter, mast, surface characteristics, fine-scale hydrology such as vernal pools or seeps, etc. The Habitat Systems and Structural Modifiers used in this classification are generally discernable from satellite imagery or aerial photos; habitat elements are at a scale that generally requires on-the-ground work to assess. For applications requiring that level of detail, we envision the NETHCS as providing a useful superstructure.

Summary Statistics

The 143 habitat systems in the NETHCS are grouped into 35 USNVC macrogroups covering forests to sparse vegetation and natural forests to highly managed agricultural systems. Upland forest (30 habitat systems) and woody wetlands are the most numerous NLCD classes, as would be expected in the naturally forested northeastern landscape (Table 7). Large-patch and small-patch systems are the most numerous in terms of landscape pattern; matrix systems, covering large acreages, are few in number (Table 8).

The number of habitat systems per jurisdiction ranges from 23 to 95 (Table 9); the linear relationship to state area (Figure 5) suggests that regionalizing the classification also serves the purpose of removing the tendency of small states to more finely divide their habitats (see Figure 3).

Table 7. Number of habitat systems by NLCD class[3]

NLCD	# of Habitat systems
21 - Developed, Open Space	2
22 - Developed, Low Intensity	2
23 - Developed, Medium Intensity	1
24 - Developed, High Intensity	1
31 - Barren Land	17
32 - Unconsolidated Shore	3
41 - Deciduous Forest	15
42 - Evergreen Forest	14
43 - Mixed Forest	11
52 - Scrub/Shrub	15
72 - Grassland/Herbaceous	6
81 - Pasture/Hay	1
82 - Cultivated Crops	1
90 - Woody Wetlands	40
95 - Emergent Herbaceous Wetland	9
96 - Palustrine Emergent Wetland (Persistent)	5

Table 8. Number of habitat systems by predominant landscape pattern.

Matrix	7
Large patch	61
Small patch	52
Linear	16
undefined (altered)	9

Table 9. Number of habitat systems by state, including unconfirmed attributions.

VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
95	**43**	**23**	**59**	**38**	**33**	**65**	**80**	**47**	**62**	**40**	**56**	**60**	**61**

[3] Each habitat system was assigned to the NLCD class most representative of it; however, forested systems in particular can have different expressions that would fall into different NLCD classes. For example, an area classed as Appalachian (Hemlock)-Northern Hardwood Forest might be dominated by northern hardwoods (NLCD 41), by hemlock (NLCD 42), or by a mixture of the two (NLCD 43).

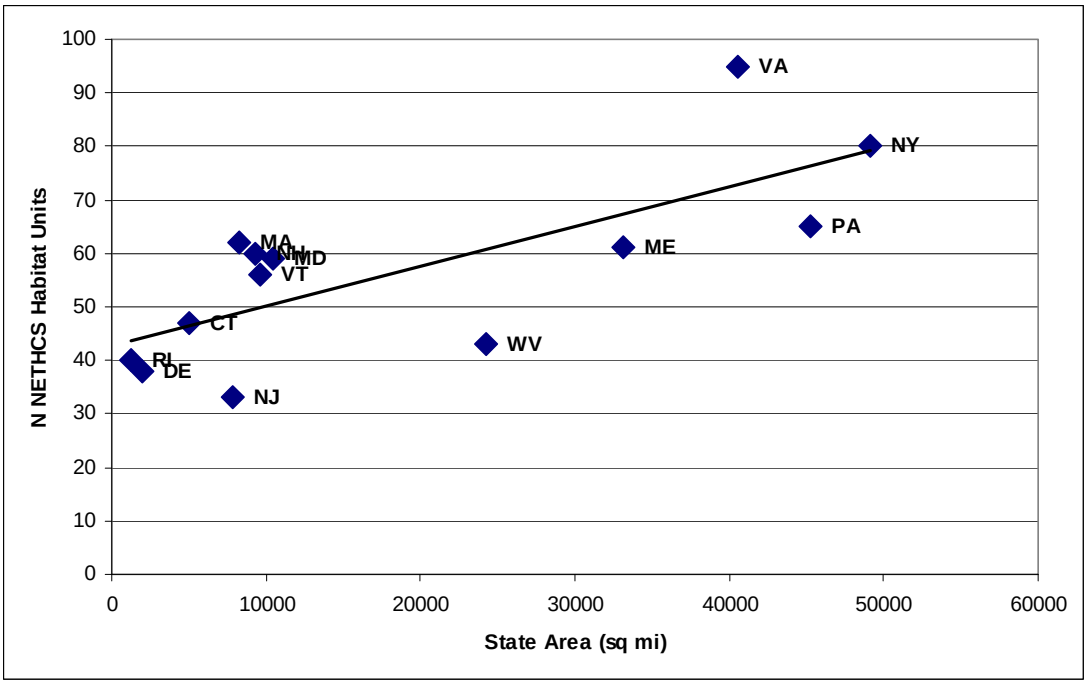

Figure 5. Relationship of state area to number of NETHCS habitat systems.
Compare to Figure 3, showing the number of SWAP habitat units relative to state area.

Final Classification

The final classification (Table 10 below) is presented in an Excel file that accompanies this report. The habitat systems are arranged by Formation and Macrogroup (Table 5), and within macrogroup, grouped by "home" division (Div. 201, Div. 202, or Div. 203, Figure 1) and then alphabetically by name. The file contains several worksheets:

- Habitat Systems Hierarchy (Table 5 above)
- Habitat Systems Detail (below)
- Modifiers (Table 6 above)
- Habitat System Descriptions, with hyperlinks to the Habitat Systems Detail sheet
- Divisions graphic (Figure 1 above)
- Ecoregions graphic (Figure 2 above)
- Cross-reference between Macrogroup names in NETHCS and USNVC (Appendix B).

Additional information on the ecological systems (the habitat systems that are natural or near-natural, i.e., not in the ruderal, exotic, agricultural, or developed macrogroups) can be found at NatureServe Explorer, http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol.

The crosswalk between habitat systems and state SWAP habitat types can be found in Appendix D, and is also available as an Excel file.

The NETHCS Excel files can be downloaded from http://rcngrants.org/node/38.

Table 10. Northeast Terrestrial Habitat Classification System, habitat systems & state distributions.
Formations and Macrogroups, used to organize the habitat systems, are explained in Table 5. The "home div." column refers to the biogeographic division (Fig. 1) central to the habitat system's concept; each ecological system is assigned one "home division", though its range may extend to others. This serves as a convenient biogeographic grouping of habitat systems within the macrogroups. Altered and developed habitat systems are not assigned a "home division". The "NE Scale" column refers to the landscape scale of the habitat system, described on p.3.

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
FORMATION CLASS 1. FOREST AND WOODLAND																			
1.C.1	Southeastern Upland Forest	**Longleaf Pine**	203	Atlantic Coastal Plain Upland Longleaf Pine Woodland	LP	X													
				Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoods	LP	?													
1.C.2	Northeastern Upland Forest	**Southern Oak-Pine**	202	Southern Appalachian Low-Elevation Pine Forest	LP	X													
			203	Central Atlantic Coastal Plain Maritime Forest	LP	X													
		Central Oak-Pine	202	Allegheny-Cumberland Dry Oak Forest and Woodland	LP	X	X					?							
				Eastern Serpentine Woodland	LP	X			X			X							
				Appalachian Shale Barrens	SP	X	X		X			X							
				Central and Southern Appalachian Montane Oak Forest	LP	X	X		?										
				Central Appalachian Dry Oak-Pine Forest	M	X	X	X	X			X	X	X	X	X	X	X	X
				Central Appalachian Pine-Oak Rocky Woodland	LP	X	X		X			X	X	X	X		X	X	X

[4] Hyperlinks are active in NETHCS Excel sheet but not in this representation.
[5] Landscape pattern: M = Matrix, LP = Large Patch, SP = Small Patch, L = Linear.

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
				Northeastern Interior Dry-Mesic Oak Forest	M	X	X	X	X			X	X						
				Northeastern Interior Pine Barrens	LP							X	X	X	X	X	X	X	X
				Piedmont Hardpan Woodland and Forest	LP	X			X										
				Southern Appalachian Montane Pine Forest and Woodland	LP	X	X		X			X							
				Southern Appalachian Oak Forest	LP	X	X												
				Southern Piedmont Dry Oak-(Pine) Forest	M	X													
				Southern Ridge and Valley / Cumberland Dry Calcareous Forest	LP	X	X												
			203	Southern Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest	SP	X													
				Northern Atlantic Coastal Plain Calcareous Ravine	SP	X			X	?	?								
				Northern Atlantic Coastal Plain Hardwood Forest	LP	X			X	X		X	X	X	X			X	X
				Northern Atlantic Coastal Plain Maritime Forest	LP	X			X	X		X	X		X				
				Northern Atlantic Coastal Plain Pitch Pine Barrens	LP				X	X		X	X		X	X		X	X
		Northern Hardwood & Conifer	201	Laurentian-Acadian Northern Hardwoods Forest	M							X	X		X		X	X	X
				Laurentian-Acadian Northern Pine-(Oak) Forest	LP							X	X				X	X	X
				Laurentian-Acadian Pine-Hemlock-Hardwood Forest	M							X	X			X	X	X	X

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
			202	Appalachian (Hemlock)-Northern Hardwood Forest	M	X	X		X			X	X	X	X		X	X	X
				North-Central Interior Beech-Maple Forest	LP							X	X						
				South-Central Interior Mesophytic Forest	LP	X	X					X	X						
				Southern and Central Appalachian Cove Forest	LP	X	X		X										
				Southern Appalachian Northern Hardwood Forest	LP	X													
				Southern Piedmont Mesic Forest	LP	X													
			203	Southern Atlantic Coastal Plain Mesic Hardwood Forest	LP	X		X	X	X									
		Plantation and Ruderal Forest	all	Managed Tree Plantation		X	X		X	X	X	X	X	X	X	X	X	X	X
				Ruderal Forest - Northern and Central Hardwood and Conifer		X	X		X	X	X	X	X	X	X	X	X	X	X
		Exotic Upland Forest	all	Introduced Upland Vegetation - Tree		X	X		X	X	X	X	X	X	X	X	X	X	X
1.C.3	Northeastern Wetland Forest	**Southern Bottomland Forest**	202	Southern Piedmont Large Floodplain Forest	L	X													
				Southern Piedmont Small Floodplain and Riparian Forest	L	X													
			203	Atlantic Coastal Plain Blackwater Stream Floodplain Forest	L	X													
				Atlantic Coastal Plain Brownwater Stream Floodplain Forest	L	X													
				Atlantic Coastal Plain Small Brownwater River Floodplain Forest	L	X													

Formation Code & Name	MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
	Coastal Plain Swamp	203	Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	LP	X													
			Central Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest	LP	X													
			Northern Atlantic Coastal Plain Basin Peat Swamp	LP	X		X	X	X	X	?	X	X	X	?			
			Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest	LP	X		X	X	X	X	X	X						
			Northern Atlantic Coastal Plain Pitch Pine Lowland	LP				X	?	X								
			Northern Atlantic Coastal Plain Tidal Swamp	SP	X		?	X	X	X		X						
			Southern Atlantic Coastal Plain Tidal Wooded Swamp	LP	X													
	Central Hardwood Swamp	202	Central Interior Highlands and Appalachian Sinkhole and Depression Pond	SP	X	X		X	X		X							
			North-Central Interior Wet Flatwoods	SP							X	X	X	X		X		
			Piedmont Upland Depression Swamp	SP	X			X										
	Northeastern Floodplain Forest	201	Laurentian-Acadian Floodplain Systems	L								X		X		X	X	X
		202	Central Appalachian River Floodplain	LP	X	X	X	X		X	X	X	X	X		X	X	
			Central Appalachian Stream and Riparian	L	X	X	X	X			X	X	X	X		X	X	
			South-Central Interior Large Floodplain	L	X	X					X							
			South-Central Interior Small Stream and Riparian	L	X	X					X							

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
			203	Northern Atlantic Coastal Plain Stream and River	L	X		X	X	X	X								
		Northern Swamp	201	Acadian-Appalachian Conifer Seepage Forest	LP								X				X	X	X
				Laurentian-Acadian Alkaline Conifer-Hardwood Swamp	LP								X	X		?	X		X
				Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp	LP							X	X	X	X		X	X	X
			202	High Allegheny Wetland	LP		X		X			?							
				North-Central Appalachian Acidic Swamp	LP	X		X	X		?	X	X	X	X	X	X	X	
				North-Central Interior and Appalachian Rich Swamp	SP				X	X		X	X	X	X	X	X		
1.D.1	Boreal Upland Forest	**Boreal Upland Forest**	201	Acadian Low-Elevation Spruce-Fir Forest and Flats	M							X	X				X	X	X
				Acadian Sub-Boreal Spruce Barrens	LP												X	X	X
				Acadian-Appalachian Montane Spruce-Fir Forest	LP								X		X		X	X	X
				Boreal Jack Pine-Black Spruce Forest	LP														X
			202	Central and Southern Appalachian Spruce-Fir Forest	LP	X	X												
1.D.2	Boreal Wetland Forest	**Boreal Forested Peatland**	201	Boreal-Laurentian Conifer Acidic Swamp	LP								X				X	X	X
FORMATION CLASS 2. SHRUBLAND AND GRASSLAND																			
2.C.1	Grassland & Shrubland	**Glade and Savanna**	201	Great Lakes Alvar	LP								X						
			202	Central Appalachian Alkaline Glade and Woodland	SP	X	X		X			X		X	?				

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
				Cumberland Sandstone Glade and Barrens	SP	?													
				North-Central Oak Barrens	LP							?	X						
				Southern and Central Appalachian Mafic Glade and Barrens	SP	X			X			?							
				Southern Piedmont Glade and Barrens	SP	X													
				Southern Ridge and Valley Calcareous Glade and Woodland	SP	X													
		Outcrop & Summit Scrub	201	Laurentian Acidic Rocky Outcrop	SP								X						
				Laurentian-Acadian Calcareous Rocky Outcrop	SP								X				X	X	X
				Northern Appalachian-Acadian Rocky Heath Outcrop	SP							X	X		X	?	X	X	X
			202	Southern Appalachian Grass and Shrub Bald	SP	X	X												
		Lake & River Shore	201	Laurentian-Acadian Lakeshore Beach	SP								X		?	?	X	X	X
		Ruderal Shrubland & Grassland	all	Introduced Shrubland		X	X	X	X	X	X	X	X	X	X	X	X	X	X
				Powerline Right-of-Way		X	X	X	X	X	X	X	X	X	X	X	X	X	X
				Ruderal Upland - Old Field		X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.C.3	Coastal Scrub-Herb	**Coastal Grassland & Shrubland**	201	Great Lakes Dune	SP								X				X		
				Great Lakes Dune and Swale	SP							X	X						
			203	Northern Atlantic Coastal Plain Dune and Maritime Grassland	LP	X			X	X			X	X	X	X		X	X
				Northern Atlantic Coastal Plain Heathland and Grassland	LP								X	X	X	X			

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
				Northern Atlantic Coastal Plain Sandy Beach	L	X			X	X			X	X	X	X		X	X
2.C.4	Peatland	**Northern Peatland**	201	Acadian Maritime Bog	LP														X
				Boreal-Laurentian Bog	LP								X				X		X
				Boreal-Laurentian-Acadian Acidic Basin Fen	LP								X		X		X	X	X
				Laurentian-Acadian Alkaline Fen	SP							X	X		X		X	X	X
			202	North-Central Interior and Appalachian Acidic Peatland	SP				?			X	X	X	X	X	X	X	X
		Coastal Plain Peatland	203	Atlantic Coastal Plain Northern Bog	SP						X		X		X				
				Atlantic Coastal Plain Peatland Pocosin and Canebrake	LP	X													
		Central Appalachian Peatland	202	North-Central Appalachian Seepage Fen	SP	X	X		X	?	X	X	X	X	X		X		
				North-Central Interior Shrub-Graminoid Alkaline Fen	SP							X							
				Southern and Central Appalachian Bog and Fen	SP	X													
				Southern Appalachian Seepage Wetland	SP	X													
2.C.5	Freshwater Marsh	**Coastal Plain Pond**	203	Northern Atlantic Coastal Plain Pond	SP	X		X	X	X			X		X		X		X
				Southern Atlantic Coastal Plain Depression Pondshore	SP	X													
		Emergent Marsh	201	Laurentian-Acadian Freshwater Marsh	LP							X	X	X	X	X	X	X	X
			202	Great Lakes Freshwater Estuary and Delta	LP							X	X						

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
			203	Atlantic Coastal Plain Embayed Region Tidal Freshwater Marsh	SP	X													
				Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	LP	X		X	X	X	X	X	X	X	X	X			
		Wet Meadow / Shrub Marsh	201	Laurentian-Acadian Wet Meadow-Shrub Swamp	LP						?	X	X	X	X	X	X	X	X
			203	Southeastern Coastal Plain Interdunal Wetland	SP	X													
			all	Introduced Wetland and Riparian Vegetation	SP	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Modified/Managed Marsh	all	Modified/Managed Marsh	SP	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.C.6	Salt marsh	**Salt Marsh**	201	Acadian Coastal Salt Marsh	SP										X			X	X
				Acadian Estuary Marsh	SP										X			X	X
			203	Atlantic Coastal Plain Embayed Region Tidal Salt and Brackish Marsh	LP	X													
				Northern Atlantic Coastal Plain Brackish Tidal Marsh	LP	X			X	X	X		X	X	X	X			
				Northern Atlantic Coastal Plain Tidal Salt Marsh	LP	X			X	X	X		X	X	X	X		X	X
FORMATION CLASS 4. POLAR AND HIGH MONTANE																			
4.B.1	Alpine	**Alpine**	201	Acadian-Appalachian Alpine Tundra	LP								X				X	X	X
				Acadian-Appalachian Subalpine Woodland and Heath-Krummholz	LP								X				X	X	X
FORMATION CLASS 5. AQUATIC (in part)																			

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
5.A.1	Intertidal (nonvascular)	**Intertidal Shore**	201	North Atlantic Intertidal Mudflat	LP	X			X	X	X		X	X	X	X		X	X
				North Atlantic Rocky Intertidal	L								X	X	X	X		X	X
				North Atlantic Tidal Sand Flat	LP	X			X	X	X		X	X	X	X		X	X
FORMATION CLASS 6. SPARSELY VEGETATED ROCK																			
6.B.2	Cliff & Rock	**Cliff and Talus**	201	Laurentian-Acadian Acidic Cliff and Talus	SP								X		X		X	X	X
				Laurentian-Acadian Calcareous Cliff and Talus	SP								X				X	X	X
			202	Central Interior Calcareous Cliff and Talus	SP							X	X						
				Cumberland Acidic Cliff and Rockhouse	SP	X	X					X								
				North-Central Appalachian Acidic Cliff and Talus	SP	X	X		X			X	X	X	X		X		
				North-Central Appalachian Circumneutral Cliff and Talus	SP	X	X		X			X	X		X		X	X	
				Southern Appalachian Montane Cliff and Talus	SP	X														
				Southern Appalachian Spray Cliff	SP	X	X													
				Southern Interior Calcareous Cliff	SP	X														
				Southern Piedmont Cliff	SP	X														
			203	Northeastern Erosional Bluff	L	?			X			X	X	?	X		X	X	X
		Flatrock	202	Southern Appalachian Granitic Dome	SP	X													

Formation Code & Name		MACROGROUP	home div.	HABITAT SYSTEM (click to go to description[4])	NE Scale[5]	VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
				Southern Piedmont Granite Flatrock and Outcrop	SP	X													
		Rocky Coast	201	Acadian-North Atlantic Rocky Coast	SP									X	X	X		X	X
				North Atlantic Cobble Shore	L										X			X	X
FORMATION CLASS 7. AGRICULTURAL																			
7	Agricultural	**Agricultural**	all	Cultivated Crops		X	X		X	X	X	X	X	X	X	X	X	X	X
				Pasture/Hay		X	X		X	X	X	X	X	X	X	X	X	X	X
FORMATION CLASS 8. DEVELOPED																			
		Maintained Grasses and Mixed Cover	all	Urban & Recreational Grasses		X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Urban/Suburban Built	all	Commercial/Industrial		X	X	X	X	X	X	X	X	X	X	X	X	X	X
				Residential - High Intensity		X	X	X	X	X	X	X	X	X	X	X	X	X	X
				Residential - Medium Intensity		X	X	X	X	X	X	X	X	X	X	X	X	X	X
				Residential - Low Intensity		X	X		X	X	X	X	X	X	X	X	X	X	X
				Residential - Rural / Sparse		X	X		X	X	X	X	X	X	X	X	X	X	X
		Extractive	all	Quarries/Pits/Stripmines		X	X	X	X	X	X	X	X	X	X	X	X	X	X

Future Work

The original outline for this project called for a plan to move forward with habitat mapping once the NETHCS was in place. The Nature Conservancy (TNC) and NatureServe have collaborated on such a plan, applied for funding from the Regional Conservation Needs grant program, and are moving ahead on mapping the NETHCS across the region.

The 2007 Northeast Regional Conservation Needs Grant Program Request for Proposals included as its Priority #1 Regional Conservation Need "The Creation of Regional Habitat Cover Maps". TNC was awarded the funding and has begun the work in collaboration with NatureServe and several of its partner natural heritage programs. Selected state wildlife agencies will be brought into the process. The product will be a comprehensive wildlife habitat map of the eastern region, including all states from Maine to Virginia, west to New York, Pennsylvania and West Virginia. The map will consist of a spatially comprehensive GIS grid of 30 meter pixels with a legend portraying the Northeastern Terrestrial Habitat Classification System (NETHCS). We envision a series of map legends that range from coarser-scale with higher accuracy (habitat systems or macrogroups) to finer-scale with lower accuracy (USNVC associations or alliances). Not every habitat type will be equally amenable to the mapping procedures described here, and, as discussed during the development of the NETHCS, small-patch habitat systems in particular may not be mappable at a regional scale. However, the regional map will provide a base for habitat conservation across the Northeast.

The map is expected to be complete in the second half of 2009.

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Appendices

Appendix A: Glossary

agromorphic – vegetation character and structure having to do with agriculture.

baygall – vegetation and soils associated with headwater streams (permanent or intermittent) of upland southeastern pine forests.

blackwater (stream or river) – streams or rivers derived from low-nutrient sandy substrates in which waters are stained dark by tannins and suspended solids are few. cf. *brownwater.* In the east, the term is commonly used only from Virginia south.

bog – technically, a peat-based wetland in which the growing surface is elevated above groundwater by peat accumulation, such that all nutrients are derived from the atmosphere and precipitation (cf. fen). True bogs are boreal and sub-boreal; the word is commonly used throughout the Northeast to refer to any nutrient-poor peatland with a Sphagnum moss substrate and heath family shrubs as common plants, whether it is technically a bog or a fen.

brownwater (stream or river) – streams or rivers derived from substrates that yield silts and clays that remain suspended in the water, which often looks muddy. cf. *blackwater*. In the east, the term is commonly used only from Virginia south.

bryophytes – a group of non-vascular plants including mosses, liverworts, and hornworts.

calciphilic – literally, "calcium-loving"; usually refers to plants that are usually found in high-pH habitats.

canebrake – dense growths of the tall bamboo-like grasses *Arundinaria* spp. that form thickets along watercourses and certain other lowlands in the Southeast.

Central Interior and Appalachian – a geographic division occupying the east-central United States; see Figure 1.

colluvial – soils derived from colluvium, i.e., soil material that has collected at the bottom of a slope.

disjunct – separated from the species's or community's usual contiguous range by a substantial distance.

ecological system - recurring groups of biological communities that are found in similar physical environments and are influenced by similar dynamic ecological processes, such as fire or flooding (Comer et al. 2003).

ecotone – a transition area where one type of ecological community gives way to another (e.g. upland forest meeting a rivershore).

edaphic – relating to soils.

fen – technically, a peat-based wetland in which the vegetation is in contact with the groundwater. While fens have more nutrients available to the vegetation than true bogs, the term encompasses a wide range of nutrient conditions from low-nutrient "poor fens" to high-nutrient "rich fens". Most wetlands called "bogs" south of northern New England are actually poor fens.

flatwoods – forests that develop in flat basins that are generally flooded for only part of the year.

floristic – having to do with plant species composition.

fruticose lichens – lichens that look like miniature shrubs, e.g. reindeer lichens, as opposed to lichens that are more or less flat on their substrate.

GAP – Gap Analysis Program: a wildlife habitat mapping and analysis approach coordinated by the U.S. Geological Survey and applied regionally across the U.S. "The goal of the GAP Analysis Program is to keep common species common by identifying those species and plant communities that are not adequately represented in existing conservation lands. By identifying their habitats, GAP Analysis gives land managers and policy makers the information they need

to make better-informed decisions when identifying priority areas for conservation." Further information at http://gapanalysis.nbii.gov/portal/server.pt

graminoid – collectively, grasses, sedges, and rushes – grass-like vascular plants.

Gulf and Atlantic Coastal Plain - a geographic division occupying the coastal and near-coastal eastern United States and characterized by mostly flat topography; see Figure 1.

habitat – the physical and biological environment that provides the necessary food, shelter, and other needs of a particular organism.

hardpan – a soil layer that prevents water from moving downward.

hortomorphic – vegetation character and structure of developed (human-created) landscapes, including lawns and ornamentals.

krummholz – in the zone just above treeline, trees or other woody plants that grow as a dense shrub layer as a result of exposure to severe weather, especially wind.

LANDFIRE - a multi-agency project describing and mapping vegetation, wildland fuel, and fire regimes across the United States; see p. 3 and www.landfire.gov.

large patch system – a community or ecological system that occupies a particular landscape setting at intermediate scales, generally occupying 50-2,000 hectares under natural conditions. Part of the "matrix / large patch / small patch / linear" suite of landscape pattern descriptors.

Laurentian-Acadian - a geographic division occupying parts of the northern Northeast and upper Midwest; see Figure 1. "Laurentian" refers mostly to the western part of the division and "Acadian" to the eastern part.

linear system – a community or ecological system that occurs as long narrow strips, often at the ecotone between terrestrial and aquatic systems. Part of the "matrix / large patch / small patch / linear" suite of landscape pattern descriptors.

lithology – having to do with, or describing, rock.

macroalgae – multicellular algae; for our purposes a.k.a. seaweeds.

macrogroup – a set of vegetation communities defined by "combinations of moderate sets of diagnostic plant species and diagnostic growth forms that reflect biogeographic differences in composition, and sub-continental to regional differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes" (FGDC 2008)

mafic – rocks, or the soils derived from them, with a high iron and magnesium content. Mafic soils often support distinctive plant communities.

marl – precipitated calcium from plant metabolism; usually referring to a substrate of high pH as a result of the marl deposits.

matrix system – ecological communities or systems that define the landscape character of an area: they occupy large contiguous areas and typically have wide ecological amplitudes, generally occupying areas of > 2,000 hectares under natural conditions. Part of the "matrix / large patch / small patch / linear" suite of landscape pattern descriptors.

mesic – used in describing soil moisture regimes: neither particularly wet nor very dry.

mesophytic – a plant community characteristic of upland habitats in the unglaciated eastern U.S., with moderate climate and deep, usually somewhat enriched, soils; usually referring to particular forest types ("mixed mesophytic forest" type of Braun 1950).

MRLC – Multi-Resolution Land Consortium (www.mrlc.com) : a conglomeration of public and private organizations in the U.S. that coordinates production and serving of map products (primarily remotely sensed) including the National Land Cover Database (NLCD, see that entry).

natural (including semi-natural) **vegetation** - vegetation where ecological processes primarily determine species and site characteristics; that is, vegetation comprised of a largely spontaneously growing set of plant species that are shaped by both site and biotic processes (FGDC 2008).

NEAFWA – Northeast Association of Fish and Wildlife Agencies (www.neafwa.org), representing the 13 states plus the District of Columbia.

NETHCS – Northeast Terrestrial Habitat Classification System: the classification of wildlife habitat presented in this report.

NLCD – National Land Cover Database: a map product categorizing land cover based on satellite imagery, coordinated and served by the Multi-Resolution Land Consortium (MRLC, see that entry). http://www.epa.gov/mrlc/nlcd-2001.html

oligohaline – the part of salinity gradient that approaches freshwater, usually less than 5 ppt dissolved salts.

orographic – precipitation (generally on the windward side) or lack of precipitation (generally on the leeward side) caused by the movement of an air mass (and the cooling of its component water vapor as it rises) as it passes over a mountain range or other topographic form.

pocosin – a type of wetland found in the coastal plain of the southeastern U.S.; pocosins typically have a peat and sand substrate, low nutrients, and are characterized by shrubby vegetation. Fire is an important disturbance factor in many pocosins.

ruderal – a plant species or vegetation that colonizes recently disturbed lands.

savanna – a grassland with widely scattered trees.

scree – accumulations of small rocks and gravel forming a steep slope below a cliff or other outcrop as a result of weathering and freeze-thaw cycles; cf. talus.

seepage – groundwater that emerges from the soil (as opposed to surface water which is runoff) as a water source for some wetlands.

serpentine – a greenish rock composed of specific magnesium and iron silicates; it weathers to soils that can support only certain plant communities where the plants can tolerate the unusual soil minerals.

SGCN – Species of Greatest Conservation Need: a term from the SWAPs (see that entry) which called for each state to identify its species of greatest conservation need.

small patch system – ecological communities or systems that occur under very localized environmental conditions and that are distinctly different from the surrounding landscape; ranging in area from less than an acre to several hectares. Part of the "matrix / large patch / small patch / linear" suite of landscape pattern descriptors.

SWAP – State Wildlife Action Plan: plans summarizing the status and management/conservation needs of wildlife and their habitats, and the state capacity to address those, developed under federal mandate by all states, first round completed in 2005; sometimes referred to as the state's Comprehensive Wildlife Conservation Strategy (CWCS).

talus – piles of broken rock accumulating below a cliff or other outcrop as a result of weathering and freeze-thaw cycles. Related to *scree*, but talus refers to larger rock and boulders.

traprock – rock outcrops of certain igneous plutons, usually basaltic, that tend to form vertical fractures and sometimes step-like arrangements. In the Northeast, common in parts of the Hudson and Connecticut River valleys.

unconsolidated – mineral substrates (sand, rock, or anything in between) that are loose, not held together as bedrock or conglomerate.

USNVC – U.S. National Vegetation Classification: a consistent classification of vegetation of the United States, following the FGDC National Vegetation Classification Standard (FGDC 2008) and maintained by NatureServe. Also referred to as **NVC**, but USNVC is used here to distinguish from classifications that may exist in other nations.

xeric - used in describing soil moisture regimes: dry.

Appendix B: USNVC organizing hierarchy, Formation to Macrogroup

This appendix provides a reference between the names used in the NETHCS (yellow columns) and the names used in the USNVC (green columns). The Formation codes (e.g. "1.C.2") are the same in both. The USNVC (FGDC 2008) standard uses somewhat more technical names for Formations. Macrogroups are in the process of being finalized for the USNVC, and the names are also somewhat more technical.

	FORMATION		MACROGROUP	
	NETHCS name	USNVC name (FGDC 2008)	NETHCS name	USNVC name
FORMATION CLASS 1. FOREST AND WOODLAND				
1.C.1	Southeastern Upland Forest	Warm Temperate Forest	Longleaf Pine	Coastal Plain Pine Forest
1.C.2	Northeastern Upland Forest	Cool Temperate Forest	Southern Oak-Pine	Southern Hardwood & Pine Forest
			Central Oak-Pine	Central Oak - Hardwood & Pine Forest
			Northern Hardwood & Conifer	Northern & Central Mesophytic Hardwood & Conifer Forest
			Plantation and Ruderal Forest	Eastern North America Ruderal Forest & Plantation
			Exotic Upland Forest	Exotic Hardwoods Forest
1.C.3	Northeastern Wetland Forest	Temperate Flooded & Swamp Forest	Southern Bottomland Forest	Southern Bottomland Flooded & Swamp Forest
			Coastal Plain Swamp	Southern Coastal Plain Broadleaf Evergreen & Conifer Swamp
			Central Hardwood Swamp	Northern & Central Hardwood Swamp Forest
			Northeastern Floodplain Forest	Northern & Central Floodplain Forest
			Northern Swamp	Northern Hardwood & Conifer Swamp
1.D.1	Boreal Upland Forest	Lowland & Montane Boreal Forest	Boreal Upland Forest	Eastern Boreal Conifer & Hardwood
1.D.2	Boreal Wetland Forest	Boreal Flooded & Swamp Forest	Boreal Forested Peatland	Central & Eastern Boreal Flooded & Swamp Forest

	FORMATION		MACROGROUP	
	NETHCS name	USNVC name (FGDC 2008)	NETHCS name	USNVC name
FORMATION CLASS 2. SHRUBLAND AND GRASSLAND				
2.C.1	Grassland and Shrubland	Temperate Grassland, Meadow & Shrubland	Glade and Savanna	Eastern Temperate Forest Region Grasslands & Glades
			Outcrop/Summit Scrub	Eastern Outcrop/Summit Scrub & Meadow
			Lake & River Shore	Eastern Lake & River Upland Shore
			Ruderal Shrubland & Grassland	Eastern Ruderal Shrubland & Grassland
2.C.3	Coastal Scrub-Herb	Temperate & Boreal Scrub & Herb Vegetation	Coastal Grassland & Shrubland	Eastern Coastal Grassland & Shrubland
2.C.4	Peatland	Temperate & Boreal Bog & Fen	Northern Peatland	North American Boreal Bog & Acid Fen
			Coastal Plain Peatland	Southeast Coastal Plain Bog & Fen
			Central Appalachian Peatland	Appalachian & Interior Plateau Bog & Fen
2.C.5	Freshwater Marsh	Temperate & Boreal Freshwater Marsh	Coastal Plain Pond	Atlantic & Gulf Coastal Plain Pondshore and Wet Prairie
			Emergent Marsh	Eastern North America Freshwater Marsh
			Wet Meadow / Shrub Marsh	Eastern North America Wet Meadow & Prairie
			Modified/Managed Marsh	Eastern North America Impounded Wetland
2.C.6	Salt Marsh	Salt Marsh	Salt Marsh	North American Atlantic Salt Marsh
FORMATION CLASS 4. POLAR AND HIGH MONTANE				
4.B.1	Alpine	Alpine Scrub, Forb Meadow & Grassland	Alpine	Eastern North America Alpine Scrub and Meadow
FORMATION CLASS 5. AQUATIC				
5.A.1	Intertidal (nonvascular)	Marine & Estuarine Saltwater Aquatic Vegetation	Intertidal Shore	Temperate Atlantic Intertidal Shore
5.B.1	Freshwater Aquatic	Freshwater Aquatic Vegetation	Submerged/Floating Aquatic	Eastern North America Freshwater Aquatic Vegetation

	FORMATION		MACROGROUP	
	NETHCS name	USNVC name (FGDC 2008)	NETHCS name	USNVC name
FORMATION CLASS 6. SPARSELY VEGETATED ROCK				
6.B.2	Cliff & Rock	Temperate & Boreal Cliff, Scree, & Rock Vegetation	Cliff and Talus	Eastern North America Cliff, Talus, & Scree
			Flatrock	Eastern Temperate Summit & Flatrock
			Rocky Coast	Eastern North America Rocky Coast
FORMATION CLASS 7. AGRICULTURAL				
7	Agricultural	several agricultural formations	Agricultural	various macrogroups within the formations
FORMATION CLASS 8. DEVELOPED				
8	Developed	Developed Vegetation (close-cropped) AND Other Developed Urban/Built-up Vegetation	Maintained Grasses and Mixed Cover	Lawn, Vacant Lot, Flower & Herb Garden macrogroups
			Urban/Suburban Built	Lawn, Vacant Lot, Flower & Herb Garden macrogroups
			Extractive	(not vegetated)

Appendix C: Terrestrial Working Group Members & Classification Reviewers

State	Name	Title	Affiliation	e-mail	Working Group	Sept 2007 workshop	Additional Reviewer
Connecticut	Ken Metzler	Ecologist	CT DEP Wildlife Division, Wildlife Diversity Program	Kenneth.Metzler@po.state.ct.us	X	X	
DC	Betty Ackerson	Wildlife Biologist	District of Columbia Fisheries and Wildlife	betty.ackerson@dc.gov	X		
Delaware	Robert Coxe	Community Ecologist	Natural Heritage and Endangered Species Program	robert.coxe@state.de.us	X	X	
Maine	Don Katnik	Habitat Group Leader	Maine Department of Inland Fisheries & Wildlife	donald.katnik@maine.gov	X		
Maine	George Matula	Wildlife Diversity Program Manager	Maine Department of Inland Fisheries & Wildlife	george.matula@maine.gov		X	
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State	Name	Title	Affiliation	e-mail	Working Group	Sept 2007 workshop	Additional Reviewer
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Appendix D. Crosswalk between each state's SWAP habitats and NETHCS

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
CT	Estuarine Aquatic - Vegetation Beds	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
CT	Forested Inland Wetland - Atlantic White Cedar Swamps	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands
CT	Forested Inland Wetland - Floodplain Forests	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
CT	Forested Inland Wetland - Floodplain Forests	Central Appalachian Small Stream Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
CT	Forested Inland Wetland - Northern White Cedar Swamps	Laurentian-Acadian Alkaline Conifer-Hardwood Swamp	9345	Northern Swamp	90 - Woody Wetlands
CT	Forested Inland Wetland - Red/Black Spruce Swamps	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
CT	Forested Inland Wetland - Red/Black Spruce Swamps	Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp	9346	Northern Swamp	90 - Woody Wetlands
CT	Forested Inland Wetland - unspecified	North-Central Interior and Appalachian Rich Swamp	9306	Northern Swamp	90 - Woody Wetlands
CT	Forested Inland Wetland - unspecified	North-Central Interior Wet Flatwoods	9186	Central Hardwood Swamp	90 - Woody Wetlands
CT	Freshwater Aquatic - Coastal Plain Ponds	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
CT	Freshwater Aquatic - Lakes and their Shorelines	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
CT	Freshwater Aquatic - Lakes and their Shorelines	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
CT	Freshwater Aquatic - Lakes and their Shorelines	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
CT	Herbaceous Inland Wetland - Calcareous Spring Fens	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
CT	Herbaceous Inland Wetland - Freshwater Marshes	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
CT	Herbaceous Inland Wetland - Freshwater Marshes	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
CT	Herbaceous Inland Wetland - Freshwater Marshes	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
CT	Intensively Managed - Cool Season Grasslands	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
CT	Intensively Managed - Cool Season Grasslands	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
CT	Intensively Managed - Cool Season Grasslands	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
CT	Intensively Managed - Early Successional Shrublands and Forests	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
CT	Intensively Managed - Early Successional Shrublands and Forests	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub
CT	Intensively Managed - Early Successional Shrublands and Forests	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
CT	Intensively Managed - Early Successional Shrublands and Forests	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
CT	Intensively Managed - Wet Meadows	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
CT	Shrub Inland Wetland - Bogs:	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
CT	Shrub Inland Wetland - Fens	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
CT	Shrub Inland Wetland - Shrub Thickets	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
CT	Shrub Inland Wetland - Shrub Thickets	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
CT	Sparsely Vegetated Inland Wetland - Surface Spring	(n/a, small-scale habitat element within other systems)			
CT	Sparsely Vegetated Inland Wetland - Vernal Pools	(n/a, small-scale habitat element within other systems)			
CT	Tidal Wetland - Intertidal Beaches and Shores	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
CT	Tidal Wetland - Tidal Wetlands	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
CT	Tidal Wetland - Tidal Wetlands	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
CT	Tidal Wetland - Tidal Wetlands	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
CT	Unique and Man-Made - Coastal Bluffs and Headlands	Acadian-North Atlantic Rocky Coast	3189	Rocky Coast	31 - Barren Land
CT	Unique and Man-Made - Offshore Islands				
CT	Unique and Man-Made - Traprock Ridges	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
CT	Unique and Man-Made - Traprock Ridges	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
CT	Unique and Man-Made - Urban Habitats	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
CT	Unique and Man-Made - Urban Habitats	Residential - Low Intensity	22	Urban & Residential	22 - Developed, Low Intensity
CT	Unique and Man-Made - Urban Habitats	Residential - Medium Intensity	22	Urban & Residential	22 - Developed, Low Intensity
CT	Unique and Man-Made - Urban Habitats	Residential - High Intensity	23	Urban & Residential	23 - Developed, Medium Intensity
CT	Unique and Man-Made - Urban Habitats	Commercial/Industrial	24	Urban & Residential	24 - Developed, High Intensity

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
CT	Unique and Man-Made - Urban Habitats	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
CT	Upland Forest - Calcareous Forests	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
CT	Upland Forest - Coniferous Forests	Laurentian-Acadian Northern Pine-(Oak) Forest	4265	Northern Hardwood & Conifer	42 - Evergreen Forest
CT	Upland Forest - Coniferous Forests	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
CT	Upland Forest - Coniferous Forests	Managed Tree Plantation	8513	Plantation and Ruderal Forest	42 - Evergreen Forest
CT	Upland Forest - Dry Oak Forests	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
CT	Upland Forest - Dry Oak Forests	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
CT	Upland Forest - Old Growth Forests	(n/a, habitat structural character within other systems)			
CT	Upland Herbaceous - Coastal Dune	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
CT	Upland Herbaceous - Grassy Glades and Balds	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
CT	Upland Herbaceous - Sandplain and Other Warm Season Grasslands	Northern Atlantic Coastal Plain Heathland and Grassland	5275	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
CT	Upland Herbaceous - Sparsely Vegetated Sand and Gravel	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
CT	Upland Woodland and Shrub - Coastal Shrublands	Northern Atlantic Coastal Plain Maritime Forest	4322	Central Oak-Pine	43 - Mixed Forest
CT	Upland Woodland and Shrub - Pitch Pine/Scrub Oak Woodlands	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
CT	Upland Woodland and Shrub - Red Cedar Glades	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
DC	Early Successional/ Shrub-scrub/ Edge	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
DC	Early Successional/ Shrub-scrub/ Edge	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
DC	Early Successional/ Shrub-scrub/ Edge	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
DC	Emergent Non-tidal Wetlands	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DC	Emergent Non-tidal Wetlands	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
DC	Emergent Tidal Wetlands	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
DC	Floodplains	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
DC	Floodplains	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
DC	Floodplains	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
DC	Grasslands/ Managed Meadows	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
DC	Grasslands/ Managed Meadows	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
DC	Grasslands/ Managed Meadows	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
DC	Hardwood Forest - Chestnut oak forests	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
DC	Hardwood Forest - Chestnut oak forests	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
DC	Hardwood Forest - Loblolly pine-mixed oak forests:	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
DC	Hardwood Forest - Mixed oak-beech forests	Southern Atlantic Coastal Plain Mesic Hardwood Forest	4150	Northern Hardwood & Conifer	41 - Deciduous Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
DC	Hardwood Forest - Mixed oak-beech forests	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
DC	Hardwood Forest - Tulip poplar forests	Southern Atlantic Coastal Plain Mesic Hardwood Forest	4150	Northern Hardwood & Conifer	41 - Deciduous Forest
DC	Hardwood Forest - Virginia pine-oak forests	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
DC	Riparian Woodlands	Central Appalachian Small Stream Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
DC	Riparian Woodlands	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
DC	Springs and Seeps	(n/a, small-scale habitat element within other systems)			
DC	Tidal Mudflats	North Atlantic Intertidal Mudflat	3133	Intertidal Shore	32 - Unconsolidated Shore
DC	Urban Landscapes	Residential - Low Intensity	22	Urban & Residential	22 - Developed, Low Intensity
DC	Urban Landscapes	Residential - Medium Intensity	22	Urban & Residential	22 - Developed, Low Intensity
DC	Urban Landscapes	Commercial/Industrial	24	Urban & Residential	24 - Developed, High Intensity
DC	Urban Landscapes	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
DC	Urban Landscapes	Residential - High Intensity	23	Urban & Residential	23 - Developed, Medium Intensity
DC	Vernal Pools	(n/a, small-scale habitat element within other systems)			
DE	Atlantic White Cedar Non-tidal Wetlands	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands
DE	Atlantic White Cedar Non-tidal Wetlands - Atlantic White Cedar – Mixed Herb Bog	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands
DE	Atlantic White Cedar Non-tidal Wetlands - Atlantic White Cedar Millpond Headwater Hummock and Peat Mat Woodland	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
DE	Atlantic White Cedar Non-tidal Wetlands - Delmarva Atlantic White Cedar Swamp	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands
DE	Beach and Dune Habitats	Northern Atlantic Coastal Plain Maritime Forest	4322	Central Oak-Pine	43 - Mixed Forest
DE	Beach and Dune Habitats	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Beach and Dune Habitats - Bayberry - Beach Plum Maritime Shrubland	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Beach and Dune Habitats - Beach Foredune	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Beach and Dune Habitats - Beach Heather Dune Shrubland	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Beach and Dune Habitats - Beachgrass – Panicgrass Dune Grassland	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Beach and Dune Habitats - Greenbrier - Poison Ivy Dune Shrubland	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Beach and Dune Habitats - Overwash Dune Grassland	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Beach and Dune Habitats - Unvegetated Sandy Beach	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Beach and Dune Habitats - Wax-myrtle - Groundsel-tree Maritime Shrubland	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Coastal Plain Forested Floodplains and Riparian Swamps - Baldcypress – Red Maple – Swamp Black Gum Swamp	Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest	9342	Coastal Plain Swamp	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
DE	Coastal Plain Forested Floodplains and Riparian Swamps - Black Ash Seepage Swamp	Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest	9342	Coastal Plain Swamp	90 - Woody Wetlands
DE	Coastal Plain Forested Floodplains and Riparian Swamps - Black Ash Seepage Swamp	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
DE	Coastal Plain Seasonal Ponds	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Seasonal Ponds	Northern Atlantic Coastal Plain Pitch Pine Lowland	9125	Coastal Plain Swamp	90 - Woody Wetlands
DE	Coastal Plain Seasonal Ponds - Buttonbush - Mannagrass - Smartweed Coastal Plain Seasonal Pond Vegetation	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Seasonal Ponds - Buttonbush - Warty Panicgrass - Eaton's Witchgrass Coastal Plain Pond Vegetation	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Seasonal Ponds - Cape May - Delmarva Depression Meadow	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Seasonal Ponds - Creeping Rush - Boltonia Coastal Plain Seasonal Pond Vegetation	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Seasonal Ponds - Maidencane Coastal Plain Seasonal Pond Vegetation	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Seasonal Ponds - Mixed Grass Depression Meadow	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Seasonal Ponds - Three-way Sedge - Canada Rush Coastal Plain Seasonal Pond Vegetation	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
DE	Coastal Plain Seasonal Ponds - Walter's Sedge - Eaton's Witchgrass Coastal Plain Seasonal Pond Vegetation • Cape May - Delmarva Depression Meadow	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Seasonal Ponds - Waterlily Deepwater Coastal Plain Seasonal Pond Vegetation	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Coastal Plain Upland Forests	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
DE	Coastal Plain Upland Forests	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
DE	Coastal Plain Upland Forests	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest
DE	Coastal Plain Upland Forests - Ancient Sand Ridge Forest	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
DE	Coastal Plain Upland Forests - Chestnut Oak – Hairgrass Forest	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
DE	Coastal Plain Upland Forests - Tuliptree Rich Wood (Coastal Plain variant)	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
DE	Coastal Plain Upland Forests - Tuliptree Rich Wood (Coastal Plain variant)	Northern Atlantic Coastal Plain Calcareous Ravine	4156	Central Oak-Pine	41 - Deciduous Forest
DE	Coastal Plain Upland Forests - Tuliptree Rich Wood (Coastal Plain variant)	Southern Atlantic Coastal Plain Mesic Hardwood Forest	4150	Northern Hardwood & Conifer	41 - Deciduous Forest
DE	Early Successional Upland Habitats	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
DE	Early Successional Upland Habitats - Herbaceous Early Successional Upland Habitats	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
DE	Early Successional Upland Habitats - Shrub/Brush Early Successional Upland Habitats	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub
DE	Early Successional Upland Habitats - Shrub/Brush Early Successional Upland Habitats	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
DE	Early Successional Upland Habitats - Shrub/Brush Early Successional Upland Habitats	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
DE	Early Successional Upland Habitats - Shrub/Brush Early Successional Upland Habitats	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
DE	Forest Blocks	n/a, landscape aggregation of various forest habitat systems			
DE	Freshwater Tidal Forested and Scrub-Shrub Wetlands	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
DE	Freshwater Tidal Forested and Scrub-Shrub Wetlands - Atlantic White Cedar - Red Maple - Pumpkin Ash Freshwater Tidal Swamp	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
DE	Freshwater Tidal Forested and Scrub-Shrub Wetlands - Red Maple - Ash Tidal Swamp	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
DE	Freshwater Tidal Forested and Scrub-Shrub Wetlands - Smooth Alder - Silky Dogwood Shrub Swamp	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
DE	Freshwater Tidal Marshes	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
DE	Freshwater Tidal Marshes - Freshwater Intertidal Quillwort Flat	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
DE	Freshwater Tidal Marshes - Mixed Broadleaf Freshwater Tidal Marsh	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
DE	Freshwater Tidal Marshes - Sea Level Fen	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
DE	Interdunal Wetlands	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Interdunal Wetlands - Cranberry Interdunal Swale	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Interdunal Wetlands - Round-head Rush - Common Threesquare Interdunal Swale	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Interdunal Wetlands - Twig Rush Interdunal Swale	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
DE	Peat Wetlands	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Peat Wetlands - Mixed Herb Deep Peat Wetland	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
DE	Piedmont Stream Valley Wetlands - Forested Seepage Slope Wetland	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
DE	Piedmont Stream Valley Wetlands - Piedmont Streamside Seepage Wetland	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
DE	Piedmont Stream Valley Wetlands - Streamside Backwater Marsh	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
DE	Piedmont Stream Valley Wetlands - Streamside Tussock Meadow	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
DE	Piedmont Stream Valley Wetlands - Twisted Sedge Sand Bar	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
DE	Tidal High Marshes - Bishop-weed – Mixed Species Brackish Marsh	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
DE	Tidal High Marshes - Spartina High Salt Marsh	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
DE	Tidal Low Marshes - Spartina Low Salt Marsh	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
DE	Tidal Low Marshes - Unvegetated Intertidal Mudflat	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
DE	Wetland Blocks	n/a, landscape aggregation of various wetland habitat systems			
MA	Coastal Dunes, Beaches, and Small Islands - Maritime Beach Strand Community	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
MA	Coastal Dunes, Beaches, and Small Islands - Maritime Dune Community	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
MA	Coastal Dunes, Beaches, and Small Islands - Maritime Erosional Cliff Community	Northeastern Erosional Bluff	3114	Cliff and Talus	31 - Barren Land
MA	Coastal Dunes, Beaches, and Small Islands - Small Islands	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
MA	Coastal Dunes, Beaches, and Small Islands - Small Islands	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
MA	Estuaries	Acadian Estuary Marsh	9292	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
MA	Estuaries	Acadian Coastal Salt Marsh	9278	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
MA	Estuaries	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
MA	Estuaries	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
MA	Forested Swamps	Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp	9346	Northern Swamp	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
MA	Forested Swamps	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands
MA	Forested Swamps	North-Central Interior and Appalachian Rich Swamp	9306	Northern Swamp	90 - Woody Wetlands
MA	Forested Swamps	North-Central Interior Wet Flatwoods	9186	Central Hardwood Swamp	90 - Woody Wetlands
MA	Forested Swamps	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
MA	Grasslands - Abandoned pastures	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
MA	Grasslands - Active pastures	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
MA	Grasslands - Airports and military bases	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
MA	Grasslands - Airports and military bases	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
MA	Grasslands - Airports and military bases	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
MA	Grasslands - Native upland grasslands	Northern Atlantic Coastal Plain Heathland and Grassland	5275	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
MA	Grasslands - Wet meadows	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
MA	Large Landscape Mosaics	n/a, aggregation of other habitat systems			
MA	Marshes and Wet Meadows - Acidic Graminoid Fen	Boreal-Laurentian-Acadian Acidic Basin Fen	9353	Northern Peatland	90 - Woody Wetlands
MA	Marshes and Wet Meadows - Calcareous Basin Fen	Laurentian-Acadian Alkaline Fen	9198	Northern Peatland	90 - Woody Wetlands
MA	Marshes and Wet Meadows - Calcareous Seepage Marsh	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
MA	Marshes and Wet Meadows - Calcareous Seepage Marsh	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
MA	Marshes and Wet Meadows - Calcareous Sloping Fen	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
MA	Marshes and Wet Meadows - Coastal Interdunal Marsh/Swale	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
MA	Marshes and Wet Meadows - Deep Emergent Marsh	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
MA	Marshes and Wet Meadows - Kettlehole Wet Meadow	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
MA	Marshes and Wet Meadows - Shallow Emergent Marsh	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
MA	Marshes and Wet Meadows - Shallow Emergent Marsh	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
MA	Marshes and Wet Meadows - Wet Meadow	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
MA	Marshes and Wet Meadows - Wet Meadow	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
MA	Peatlands - Bogs	Atlantic Coastal Plain Northern Bog	9189	Coastal Plain Peatland	90 - Woody Wetlands
MA	Peatlands - Fens	Boreal-Laurentian-Acadian Acidic Basin Fen	9353	Northern Peatland	90 - Woody Wetlands
MA	Peatlands - Fens	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
MA	Pitch Pine/Scrub Oak	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest
MA	Pitch Pine/Scrub Oak	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
MA	Riparian Forests	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
MA	Riparian Forests	Southern Atlantic Coastal Plain Tidal Wooded Swamp	9194	Coastal Plain Swamp	90 - Woody Wetlands
MA	Riparian Forests	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
MA	Riparian Forests	Central Appalachian Small Stream Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
MA	Riparian Forests	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
MA	Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
MA	Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
MA	Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
MA	Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
MA	Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
MA	Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
MA	Rocky Coastlines	Acadian-North Atlantic Rocky Coast	3189	Rocky Coast	31 - Barren Land
MA	Rocky Coastlines	North Atlantic Cobble Shore	3132	Rocky Coast	32 - Unconsolidated Shore
MA	Shrub Swamps	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
MA	Shrub Swamps	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
MA	Upland Forest	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
MA	Upland Forest	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
MA	Upland Forest	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
MA	Upland Forest	Northern Atlantic Coastal Plain Maritime Forest	4322	Central Oak-Pine	43 - Mixed Forest
MA	Upland Forest	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
MA	Upland Forest	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
MA	Upland Forest	Managed Tree Plantation	8513	Plantation and Ruderal Forest	42 - Evergreen Forest
MA	Upland Forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
MA	Upland Forest	Acadian-Appalachian Montane Spruce-Fir Forest	4317	Boreal Upland Forest	42 - Evergreen Forest
MA	Young Forests and Shrublands	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
MA	Young Forests and Shrublands	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
MA	Young Forests and Shrublands	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
MA	Young Forests and Shrublands	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub
MD	Barrens and Dry Glades	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest
MD	Barrens and Dry Glades	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
MD	Bog and Fen Wetland Complexes	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
MD	Bog and Fen Wetland Complexes	Northern Atlantic Coastal Plain Pitch Pine Lowland	9125	Coastal Plain Swamp	90 - Woody Wetlands
MD	Bog and Fen Wetland Complexes	High Allegheny Wetland	9356	Northern Swamp	90 - Woody Wetlands
MD	Bog and Fen Wetland Complexes	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
MD	Carolina Bays	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
MD	Coastal Beaches, Dunes, and Mudflats	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
MD	Coastal Beaches, Dunes, and Mudflats	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
MD	Coastal Beaches, Dunes, and Mudflats	North Atlantic Intertidal Mudflat	3133	Intertidal Shore	32 - Unconsolidated Shore
MD	Coastal Beaches, Dunes, and Mudflats	North Atlantic Tidal Sand Flat	3134	Intertidal Shore	32 - Unconsolidated Shore
MD	Dry Oak-Pine Forests	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
MD	Dry Oak-Pine Forests	Piedmont Hardpan Woodland and Forest	4149	Central Oak-Pine	41 - Deciduous Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
MD	Dry Oak-Pine Forests	Southern Appalachian Montane Pine Forest and Woodland	4255	Central Oak-Pine	42 - Evergreen Forest
MD	Early Successional Forests - Forest edges:	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
MD	Early Successional Forests - Recently logged forests	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
MD	Early Successional Forests - Shrub-dominated natural communities	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
MD	Early Successional Forests - Shrub-dominated natural communities	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
MD	Early Successional Forests - Shrub-dominated natural communities	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
MD	Early Successional Forests - Shrub-dominated natural communities	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
MD	Early Successional Forests - Shrub-dominated natural communities	Appalachian Shale Barrens	4147	Central Oak-Pine	43 - Mixed Forest
MD	Early Successional Forests - Shrub-dominated natural communities	Appalachian Serpentine Woodland	4318	Central Oak-Pine	43 - Mixed Forest
MD	Early Successional Forests - Shrub-dominated natural communities	Southern and Central Appalachian Mafic Glade and Barrens	5415	Glade and Savanna	72 - Grassland/Herbaceous
MD	Early Successional Forests - Succeeding nonforested land	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
MD	Early Successional Forests - Temporary natural forest openings	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
MD	Floodplain Forests	Central Appalachian Small Stream Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
MD	Floodplain Forests	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
MD	Floodplain Forests	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
MD	Forested Seepage Wetlands	North-Central Interior and Appalachian Rich Swamp	9306	Northern Swamp	90 - Woody Wetlands
MD	Forested Seepage Wetlands	Southern Atlantic Coastal Plain Mesic Hardwood Forest	4150	Northern Hardwood & Conifer	41 - Deciduous Forest
MD	Forested Seepage Wetlands	Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest	9342	Coastal Plain Swamp	90 - Woody Wetlands
MD	Forested Seepage Wetlands	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
MD	Grasslands	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
MD	Grasslands	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
MD	Grasslands	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
MD	Grasslands	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
MD	Grasslands	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
MD	Grasslands	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
MD	Loblolly Pine – Oak Forests	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
MD	Loblolly Pine – Oak Forests	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
MD	Loblolly Pine – Oak Forests	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
MD	Maritime Forests and Shrublands	Central Atlantic Coastal Plain Maritime Forest	4264	Southern Oak-Pine	42 - Evergreen Forest
MD	Maritime Forests and Shrublands	Northern Atlantic Coastal Plain Maritime Forest	4322	Central Oak-Pine	43 - Mixed Forest
MD	Mesic Deciduous Forests	Southern Atlantic Coastal Plain Mesic Hardwood Forest	4150	Northern Hardwood & Conifer	41 - Deciduous Forest
MD	Mesic Deciduous Forests	Central and Southern Appalachian Montane Oak Forest	4126	Central Oak-Pine	41 - Deciduous Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
MD	Mesic Deciduous Forests	Northern Atlantic Coastal Plain Calcareous Ravine	4156	Central Oak-Pine	41 - Deciduous Forest
MD	Mesic Deciduous Forests	Southern and Central Appalachian Cove Forest	4124	Northern Hardwood & Conifer	43 - Mixed Forest
MD	Mesic Deciduous Forests	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
MD	Mesic Deciduous Forests	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
MD	Nontidal Emergent Wetlands	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
MD	Nontidal Emergent Wetlands	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
MD	Non-Tidal Shrub Wetlands	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
MD	Non-Tidal Shrub Wetlands	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
MD	Northern Conifer – Hardwood Forests	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
MD	Northern Conifer – Hardwood Forests	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
MD	Old Growth Forest	n/a, structural characteristic of forest habitat types			
MD	Oligohaline Estuaries	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
MD	Polyhaline Estuaries				
MD	Rock Outcrops and Cliffs	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
MD	Rock Outcrops and Cliffs	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
MD	Tidal Marshes	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
	Tidal Marshes	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
MD	Tidal Shrub Wetlands	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
MD	Upland Depression Swamps	Piedmont Upland Depression Swamp	9302	Central Hardwood Swamp	90 - Woody Wetlands
MD	Upland Depression Swamps	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
MD	Upland Depression Swamps	Central Interior Highlands and Appalachian Sinkhole and Depression Pond	9160	Central Hardwood Swamp	90 - Woody Wetlands
ME	Alpine	Acadian-Appalachian Alpine Tundra	5210	Alpine	52 - Scrub/Shrub
ME	Cliff Face and Rocky Outcrops	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
ME	Cliff Face and Rocky Outcrops	Laurentian-Acadian Calcareous Cliff and Talus	3144	Cliff and Talus	31 - Barren Land
ME	Cliff Face and Rocky Outcrops	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
ME	Cliff Face and Rocky Outcrops	Laurentian-Acadian Calcareous Rocky Outcrop	5461	Outcrop/Summit Scrub	52 - Scrub/Shrub
ME	Coniferous Forest	Acadian Low-Elevation Spruce-Fir Forest and Flats	4316	Boreal Upland Forest	42 - Evergreen Forest
ME	Coniferous Forest	Boreal Jack Pine-Black Spruce Forest	4247	Boreal Upland Forest	42 - Evergreen Forest
ME	Coniferous Forest	Acadian Sub-Boreal Spruce Barrens	9133	Boreal Upland Forest	42 - Evergreen Forest
ME	Coniferous Forest	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
ME	Coniferous Forest	Laurentian-Acadian Northern Pine-(Oak) Forest	4265	Northern Hardwood & Conifer	42 - Evergreen Forest
ME	Coniferous Forest	Acadian-Appalachian Montane Spruce-Fir Forest	4317	Boreal Upland Forest	42 - Evergreen Forest
ME	Coniferous Forest	Managed Tree Plantation	8513	Plantation and Ruderal Forest	42 - Evergreen Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
ME	Deciduous and Mixed Forest	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
ME	Deciduous and Mixed Forest	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
ME	Deciduous and Mixed Forest	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
ME	Deciduous and Mixed Forest	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
ME	Deciduous and Mixed Forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
ME	Dry Woodlands and Barrens	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
ME	Dry Woodlands and Barrens	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
ME	Emergent Marsh and Wet Meadows	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
ME	Emergent Marsh and Wet Meadows	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
ME	Emergent Marsh and Wet Meadows	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
ME	Emergent Marsh and Wet Meadows	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
ME	Emergent Marsh and Wet Meadows	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
ME	Estuarine Emergent Saltmarsh	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
ME	Estuarine Emergent Saltmarsh	Acadian Estuary Marsh	9292	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
ME	Estuarine Emergent Saltmarsh	Acadian Coastal Salt Marsh	9278	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
ME	Forested Wetland	Laurentian-Acadian Alkaline Conifer-Hardwood Swamp	9345	Northern Swamp	90 - Woody Wetlands
ME	Forested Wetland	Acadian-Appalachian Conifer Seepage Forest	9344	Northern Swamp	90 - Woody Wetlands
ME	Forested Wetland	Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp	9346	Northern Swamp	90 - Woody Wetlands
ME	Forested Wetland	Boreal-Laurentian Conifer Acidic Swamp	9177	Boreal Forested Peatland	90 - Woody Wetlands
ME	Forested Wetland	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
ME	Grassland, Agricultural, Old Field	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
ME	Grassland, Agricultural, Old Field	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
ME	Grassland, Agricultural, Old Field	Cultivated Crops	82	Agricultural	82 - Cultivated Crops
ME	Grassland, Agricultural, Old Field	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
ME	Grassland, Agricultural, Old Field	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
ME	Grassland, Agricultural, Old Field	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
ME	Mountaintop Forests	Acadian-Appalachian Subalpine Woodland and Heath-Krummholz	5320	Alpine	52 - Scrub/Shrub
ME	Peatlands	Boreal-Laurentian-Acadian Acidic Basin Fen	9353	Northern Peatland	90 - Woody Wetlands
ME	Peatlands	Boreal-Laurentian Bog	9354	Northern Peatland	90 - Woody Wetlands
ME	Peatlands	Acadian Maritime Bog	9301	Northern Peatland	90 - Woody Wetlands
ME	Peatlands	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
ME	Peatlands	Laurentian-Acadian Alkaline Fen	9198	Northern Peatland	90 - Woody Wetlands
ME	Rocky Coastlines and Islands	Acadian-North Atlantic Rocky Coast	3189	Rocky Coast	31 - Barren Land

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
ME	Rocky Coastlines and Islands	Laurentian-Acadian Lakeshore Beach	3182	Lake & River Shoreline	32 - Unconsolidated Shore
ME	Rocky Coastlines and Islands	North Atlantic Cobble Shore	3132	Rocky Coast	32 - Unconsolidated Shore
ME	Shrub / Early Successional and Regenerating Forest	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
ME	Shrub / Early Successional and Regenerating Forest	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub
ME	Shrub / Early Successional and Regenerating Forest	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
ME	Shrub-scrub Wetland	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
ME	Shrub-scrub Wetland	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
ME	Unconsolidated Shore (Beaches and Mudflats)	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
ME	Unconsolidated Shore (Beaches and Mudflats)	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
ME	Urban/Suburban	Residential - High Intensity	23	Urban & Residential	23 - Developed, Medium Intensity
ME	Urban/Suburban	Commercial/Industrial	24	Urban & Residential	24 - Developed, High Intensity
ME	Urban/Suburban	Residential - Medium Intensity	22	Urban & Residential	22 - Developed, Low Intensity
ME	Urban/Suburban	Residential - Low Intensity	22	Urban & Residential	22 - Developed, Low Intensity
NH	Alpine	Acadian-Appalachian Alpine Tundra	5210	Alpine	52 - Scrub/Shrub
NH	Alpine	Acadian-Appalachian Subalpine Woodland and Heath-Krummholz	5320	Alpine	52 - Scrub/Shrub

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NH	Appalachian Oak Pine Forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
NH	Appalachian Oak Pine Forest	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
NH	Cliffs	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
NH	Cliffs	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
NH	Cliffs	Laurentian-Acadian Calcareous Cliff and Talus	3144	Cliff and Talus	31 - Barren Land
NH	Coastal Islands	North Atlantic Cobble Shore	3132	Rocky Coast	32 - Unconsolidated Shore
NH	Coastal Islands	Acadian-North Atlantic Rocky Coast	3189	Rocky Coast	31 - Barren Land
NH	Coastal Sand Dunes	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
NH	Coastal Sand Dunes	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
NH	Floodplains - Major river silver maple floodplains	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
NH	Floodplains - Major river silver maple floodplains	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
NH	Floodplains - Montane/near-boreal floodplains	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
NH	Floodplains - Temperate minor river floodplains	Central Appalachian Small Stream Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
NH	Grasslands	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
NH	Grasslands	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
NH	Grasslands	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
NH	Grasslands	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NH	Grasslands	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
NH	Hemlock Hardwood Pine Forests	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
NH	Hemlock Hardwood Pine Forests	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
NH	High Elevation Spruce Fir Forests - High elevation balsam fir forests	Acadian-Appalachian Montane Spruce-Fir Forest	4317	Boreal Upland Forest	42 - Evergreen Forest
NH	High Elevation Spruce Fir Forests - Montane black spruce-red spruce forests	Acadian-Appalachian Montane Spruce-Fir Forest	4317	Boreal Upland Forest	42 - Evergreen Forest
NH	High Elevation Spruce Fir Forests - Northern hardwood-spruce-fir forests	Acadian-Appalachian Montane Spruce-Fir Forest	4317	Boreal Upland Forest	42 - Evergreen Forest
NH	Lowland Spruce Forest	Acadian Low-Elevation Spruce-Fir Forest and Flats	4316	Boreal Upland Forest	42 - Evergreen Forest
NH	Lowland Spruce Forest	Acadian-Appalachian Conifer Seepage Forest	9344	Northern Swamp	90 - Woody Wetlands
NH	Lowland Spruce Forest	Acadian Sub-Boreal Spruce Barrens	9133	Boreal Upland Forest	42 - Evergreen Forest
NH	Marsh and Shrub Wetlands	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
NH	Marsh and Shrub Wetlands	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
NH	Marsh and Shrub Wetlands	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
NH	Northern Hardwood – Conifer Forest	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
NH	Northern Hardwood – Conifer Forest	Laurentian-Acadian Northern Pine-(Oak) Forest	4265	Northern Hardwood & Conifer	42 - Evergreen Forest
NH	Peatlands - Forested Peatlands	Boreal-Laurentian Conifer Acidic Swamp	9177	Boreal Forested Peatland	90 - Woody Wetlands
NH	Peatlands - Open Peatlands	Laurentian-Acadian Alkaline Fen	9198	Northern Peatland	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NH	Peatlands - Open Peatlands	Boreal-Laurentian-Acadian Acidic Basin Fen	9353	Northern Peatland	90 - Woody Wetlands
NH	Peatlands - Open Peatlands	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
NH	Pine Barrens	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest
NH	Pine Barrens	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
NH	Salt Marshes	Acadian Estuary Marsh	9292	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NH	Salt Marshes	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NH	Salt Marshes	Acadian Coastal Salt Marsh	9278	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NH	Shrublands	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
NH	Shrublands	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
NH	Talus Slopes and Rocky Ridges - Rocky Ridges	Laurentian-Acadian Calcareous Rocky Outcrop	5461	Outcrop/Summit Scrub	52 - Scrub/Shrub
NH	Talus Slopes and Rocky Ridges - Rocky Ridges	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
NH	Talus Slopes and Rocky Ridges - Rocky Ridges	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
NH	Talus Slopes and Rocky Ridges - Talus Slopes	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
NJ	Agricultural lands	Cultivated Crops	82	Agricultural	82 - Cultivated Crops
NJ	Barrier islands	Central Atlantic Coastal Plain Maritime Forest	4264	Southern Oak-Pine	42 - Evergreen Forest
NJ	Beaches	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NJ	Brackish marsh	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NJ	Cultivated/Grasslands - Agricultural	Cultivated Crops	82	Agricultural	82 - Cultivated Crops
NJ	Cultivated/Grasslands - Grasslands	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
NJ	Cultivated/Grasslands - Grasslands	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
NJ	Cultivated/Grasslands - Grasslands	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
NJ	Dunes	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
NJ	Estuarine emergent wetlands	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NJ	Floodplains	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
NJ	Floodplains	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
NJ	Forested wetlands - cranberry bogs	Northern Atlantic Coastal Plain Pitch Pine Lowland	9125	Coastal Plain Swamp	90 - Woody Wetlands
NJ	Forested wetlands - cranberry bogs	Atlantic Coastal Plain Northern Bog	9189	Coastal Plain Peatland	90 - Woody Wetlands
NJ	Forested wetlands - hardwood swamps	Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest	9342	Coastal Plain Swamp	90 - Woody Wetlands
NJ	Forested wetlands - hardwood swamps	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
NJ	Forested wetlands - scrub-shrub	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
NJ	Forested wetlands - scrub-shrub	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
NJ	Forested wetlands - white cedar swamps	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NJ	Limestone fens	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
NJ	Riparian	Central Appalachian Stream and Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
NJ	Riparian	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
NJ	River estuaries	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NJ	Tidal freshwater marsh	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
NJ	Tidal salt marsh	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NJ	Upland forests - coniferous forest	Managed Tree Plantation	8513	Plantation and Ruderal Forest	42 - Evergreen Forest
NJ	Upland forests - deciduous forest	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
NJ	Upland forests - deciduous forest	Northern Atlantic Coastal Plain Calcareous Ravine	4156	Central Oak-Pine	41 - Deciduous Forest
NJ	Upland forests - deciduous forest	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
NJ	Upland forests - deciduous forest	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
NJ	Upland forests - deciduous forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
NJ	Upland forests - hemlock ravine	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
NJ	Upland forests - mixed deciduous-coniferous forest	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
NJ	Upland forests - mixed deciduous-coniferous forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
NJ	Upland forests - mixed deciduous-coniferous forest	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
NJ	Upland forests - pitch pine-oak forest	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NJ	Upland forests - scrub-shrub	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
NJ	Upland forests - scrub-shrub	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
NJ	Upland forests - scrub-shrub	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
NY	Estuarine Intertidal	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
NY	Estuarine Intertidal	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NY	Estuarine Intertidal	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
NY	Lacustrine Coastal Plain	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
NY	Palustrine Cultural	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
NY	Palustrine Mineral Soil Wetland	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
NY	Palustrine Mineral Soil Wetland	Great Lakes Freshwater Estuary and Delta	9268	Emergent Marsh	95 - Emergent Herbaceous Wetland
NY	Palustrine Mineral Soil Wetland	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
NY	Palustrine Mineral Soil Wetland	Central Appalachian Stream and Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NY	Palustrine Mineral Soil Wetland	Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp	9346	Northern Swamp	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
NY	Palustrine Mineral Soil Wetland	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest	9342	Coastal Plain Swamp	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	Acadian-Appalachian Conifer Seepage Forest	9344	Northern Swamp	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	Laurentian-Acadian Alkaline Conifer-Hardwood Swamp	9345	Northern Swamp	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
NY	Palustrine Mineral Soil Wetland	North-Central Interior and Appalachian Rich Swamp	9306	Northern Swamp	90 - Woody Wetlands
NY	Palustrine Mineral Soil Wetland	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
NY	Palustrine Mineral Soil Wetland	North-Central Interior Wet Flatwoods	9186	Central Hardwood Swamp	90 - Woody Wetlands
NY	Palustrine Peatlands	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
NY	Palustrine Peatlands	Atlantic Coastal Plain Northern Bog	9189	Coastal Plain Peatland	90 - Woody Wetlands
NY	Palustrine Peatlands	Boreal-Laurentian Bog	9354	Northern Peatland	90 - Woody Wetlands
NY	Palustrine Peatlands	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NY	Palustrine Peatlands	Boreal-Laurentian Conifer Acidic Swamp	9177	Boreal Forested Peatland	90 - Woody Wetlands
NY	Palustrine Peatlands	Boreal-Laurentian-Acadian Acidic Basin Fen	9353	Northern Peatland	90 - Woody Wetlands
NY	Palustrine Peatlands	Laurentian-Acadian Alkaline Fen	9198	Northern Peatland	90 - Woody Wetlands
NY	Terrestrial Alpine/Mountain	Acadian-Appalachian Alpine Tundra	5210	Alpine	52 - Scrub/Shrub
NY	Terrestrial Alpine/Mountain	Acadian-Appalachian Subalpine Woodland and Heath-Krummholz	5320	Alpine	52 - Scrub/Shrub
NY	Terrestrial Barrens/Woodlands	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest
NY	Terrestrial Barrens/Woodlands	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
NY	Terrestrial Barrens/Woodlands	North-Central Oak Barrens	5411	Glade and Savanna	72 - Grassland/Herbaceous
NY	Terrestrial Barrens/Woodlands	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
NY	Terrestrial Barrens/Woodlands	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
NY	Terrestrial Barrens/Woodlands	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
NY	Terrestrial Barrens/Woodlands	Laurentian-Acadian Calcareous Rocky Outcrop	5461	Outcrop/Summit Scrub	52 - Scrub/Shrub
NY	Terrestrial Barrens/Woodlands	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
NY	Terrestrial Coastal	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
NY	Terrestrial Coastal	Great Lakes Dune and Swale	9135	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
NY	Terrestrial Coastal	Great Lakes Dune	3137	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NY	Terrestrial Forested	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
NY	Terrestrial Forested	Acadian-Appalachian Montane Spruce-Fir Forest	4317	Boreal Upland Forest	42 - Evergreen Forest
NY	Terrestrial Forested	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
NY	Terrestrial Forested	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
NY	Terrestrial Forested	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
NY	Terrestrial Forested	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
NY	Terrestrial Forested	North-Central Interior Beech-Maple Forest	4119	Northern Hardwood & Conifer	41 - Deciduous Forest
NY	Terrestrial Forested	South-Central Interior Mesophytic Forest	4127	Northern Hardwood & Conifer	41 - Deciduous Forest
NY	Terrestrial Forested	Managed Tree Plantation	8513	Plantation and Ruderal Forest	42 - Evergreen Forest
NY	Terrestrial Forested	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
NY	Terrestrial Forested	Acadian Low-Elevation Spruce-Fir Forest and Flats	4316	Boreal Upland Forest	42 - Evergreen Forest
NY	Terrestrial Forested	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
NY	Terrestrial Forested	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
NY	Terrestrial Forested	Laurentian-Acadian Northern Pine-(Oak) Forest	4265	Northern Hardwood & Conifer	42 - Evergreen Forest
NY	Terrestrial Maritime	Northern Atlantic Coastal Plain Maritime Forest	4322	Central Oak-Pine	43 - Mixed Forest
NY	Terrestrial Maritime	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
NY	Terrestrial Maritime	Northern Atlantic Coastal Plain Heathland and Grassland	5275	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
NY	Terrestrial Open Upland	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
NY	Terrestrial Open Upland	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
NY	Terrestrial Open Upland	Laurentian-Acadian Lakeshore Beach	3182	Lake & River Shoreline	32 - Unconsolidated Shore
NY	Terrestrial Open Upland	Cultivated Crops	82	Agricultural	82 - Cultivated Crops
NY	Terrestrial Open Upland	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
NY	Terrestrial Open Upland	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
NY	Terrestrial Open Upland	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub
NY	Terrestrial Open Upland	Central Interior Calcareous Cliff and Talus	3148	Cliff and Talus	31 - Barren Land
NY	Terrestrial Open Upland	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
NY	Terrestrial Open Upland	Laurentian-Acadian Calcareous Cliff and Talus	3144	Cliff and Talus	31 - Barren Land
NY	Terrestrial Open Upland	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
NY	Terrestrial Open Upland	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
NY	Terrestrial Open Upland	Laurentian Acidic Rocky Outcrop	5463	Outcrop/Summit Scrub	52 - Scrub/Shrub
NY	Terrestrial Open Upland	Great Lakes Alvar	5458	Glade and Savanna	72 - Grassland/Herbaceous
PA	Anthropogenic Habitats (Urban/Suburban)	Residential - Medium Intensity	22	Urban & Residential	22 - Developed, Low Intensity
PA	Anthropogenic Habitats (Urban/Suburban)	Residential - High Intensity	23	Urban & Residential	23 - Developed, Medium Intensity
PA	Anthropogenic Habitats (Urban/Suburban)	Commercial/Industrial	24	Urban & Residential	24 - Developed, High Intensity

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
PA	Anthropogenic Habitats (Urban/Suburban)	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
PA	Anthropogenic Habitats (Urban/Suburban)	Residential - Low Intensity	22	Urban & Residential	22 - Developed, Low Intensity
PA	Anthropogenic Habitats (Urban/Suburban)	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
PA	Coniferous Forest (upland)	Laurentian-Acadian Northern Pine-(Oak) Forest	4265	Northern Hardwood & Conifer	42 - Evergreen Forest
PA	Coniferous Forest (upland)	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
PA	Coniferous Forest (upland)	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
PA	Coniferous Forest (upland)	Managed Tree Plantation	8513	Plantation and Ruderal Forest	42 - Evergreen Forest
PA	Coniferous Forest (upland)	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
PA	Coniferous Forest (upland)	Appalachian Shale Barrens	4147	Central Oak-Pine	43 - Mixed Forest
PA	Coniferous Forest (upland)	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
PA	Coniferous Forest (upland)	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
PA	Coniferous Forest (upland)	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
PA	Coniferous Forest (upland)	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest
PA	Coniferous Forest (upland)	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
PA	Coniferous Forest (upland)	Acadian Low-Elevation Spruce-Fir Forest and Flats	4316	Boreal Upland Forest	42 - Evergreen Forest
PA	Coniferous Forest (upland)	Southern Appalachian Montane Pine Forest and Woodland	4255	Central Oak-Pine	42 - Evergreen Forest
PA	Deciduous/Mixed Forest (upland)	North-Central Interior Beech-Maple Forest	4119	Northern Hardwood & Conifer	41 - Deciduous Forest
PA	Deciduous/Mixed Forest (upland)	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
PA	Deciduous/Mixed Forest (upland)	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
PA	Deciduous/Mixed Forest (upland)	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest
PA	Deciduous/Mixed Forest (upland)	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
PA	Deciduous/Mixed Forest (upland)	South-Central Interior Mesophytic Forest	4127	Northern Hardwood & Conifer	41 - Deciduous Forest
PA	Deciduous/Mixed Forest (upland)	Southern and Central Appalachian Mafic Glade and Barrens	5415	Glade and Savanna	72 - Grassland/Herbaceous
PA	Deciduous/Mixed Forest (upland)	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
PA	Deciduous/Mixed Forest (upland)	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
PA	Deciduous/Mixed Forest (upland)	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
PA	Deciduous/Mixed Forest (upland)	Allegheny-Cumberland Dry Oak Forest and Woodland	4123	Central Oak-Pine	41 - Deciduous Forest
PA	Deciduous/Mixed Forest (upland)	Appalachian Shale Barrens	4147	Central Oak-Pine	43 - Mixed Forest
PA	Deciduous/Mixed Forest (upland)	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
PA	Deciduous/Mixed Forest (upland)	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
PA	Deciduous/Mixed Forest (upland)	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
PA	Deciduous/Mixed Forest (upland)	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
PA	Deciduous/Mixed Forest (upland)	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
PA	Grassland Habitats - Airfields and Military	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
PA	Grassland Habitats - Farmland	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
PA	Grassland Habitats - Farmland	Cultivated Crops	82	Agricultural	82 - Cultivated Crops

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
PA	Grassland Habitats - Farmland	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
PA	Grassland Habitats - Naturally occurring barrens	Great Lakes Dune and Swale	9135	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
PA	Grassland Habitats - Naturally occurring barrens	North-Central Oak Barrens	5411	Glade and Savanna	72 - Grassland/Herbaceous
PA	Grassland Habitats - Naturally occurring barrens	Appalachian Serpentine Woodland	4318	Central Oak-Pine	43 - Mixed Forest
PA	Grassland Habitats - Naturally occurring barrens	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
PA	Grassland Habitats - Naturally occurring barrens	Southern and Central Appalachian Mafic Glade and Barrens	5415	Glade and Savanna	72 - Grassland/Herbaceous
PA	Grassland Habitats - Reclaimed Surface Mines	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
PA	Riparian Thickets/Forests	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
PA	Riparian Thickets/Forests	South-Central Interior Small Stream and Riparian	9335	Northeastern Floodplain Forest	90 - Woody Wetlands
PA	Riparian Thickets/Forests	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
PA	Riparian Thickets/Forests	South-Central Interior Large Floodplain	9334	Northeastern Floodplain Forest	90 - Woody Wetlands
PA	Riparian Thickets/Forests	Central Appalachian Stream and Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
PA	Rock Habitats	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
PA	Rock Habitats	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
PA	Rock Habitats	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
PA	Rock Habitats	Central Interior Calcareous Cliff and Talus	3148	Cliff and Talus	31 - Barren Land
PA	Rock Habitats	Cumberland Acidic Cliff and Rockhouse	3119	Cliff and Talus	31 - Barren Land
PA	Rock Habitats	Appalachian Shale Barrens	4147	Central Oak-Pine	43 - Mixed Forest
PA	Sandy Beach Habitats	Great Lakes Dune and Swale	9135	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
PA	Seasonal Wetlands (Vernal Pools)	n/a, inclusion in forest habitat systems			
PA	Thicket/Shrub Habitats - Naturally occurring barrens	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
PA	Thicket/Shrub Habitats - Naturally occurring barrens	Southern Appalachian Montane Pine Forest and Woodland	4255	Central Oak-Pine	42 - Evergreen Forest
PA	Thicket/Shrub Habitats - Naturally occurring barrens	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
PA	Thicket/Shrub Habitats - Naturally occurring barrens	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
PA	Thicket/Shrub Habitats - Temporal Shrubland/Thickets	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
PA	Wetlands - Emergent Estuarine	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
PA	Wetlands - Emergent Estuarine	Great Lakes Freshwater Estuary and Delta	9268	Emergent Marsh	95 - Emergent Herbaceous Wetland
PA	Wetlands - Emergent Freshwater	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
PA	Wetlands - Emergent Freshwater	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
PA	Wetlands - Emergent Freshwater	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
PA	Wetlands - Forested Wetlands and Bogs	Central Interior Highlands and Appalachian Sinkhole and Depression Pond	9160	Central Hardwood Swamp	90 - Woody Wetlands
PA	Wetlands - Forested Wetlands and Bogs	North-Central Interior Wet Flatwoods	9186	Central Hardwood Swamp	90 - Woody Wetlands
PA	Wetlands - Forested Wetlands and Bogs	Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp	9346	Northern Swamp	90 - Woody Wetlands
PA	Wetlands - Forested Wetlands and Bogs	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
PA	Wetlands - Forested Wetlands and Bogs	North-Central Interior and Appalachian Rich Swamp	9306	Northern Swamp	90 - Woody Wetlands
PA	Wetlands - Forested Wetlands and Bogs	Laurentian-Acadian Alkaline Fen	9198	Northern Peatland	90 - Woody Wetlands
PA	Wetlands - Forested Wetlands and Bogs	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
PA	Wetlands - Forested Wetlands and Bogs				
PA	Wetlands - Forested Wetlands and Bogs	Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest	9342	Coastal Plain Swamp	90 - Woody Wetlands
PA	Wetlands - Lakes and Ponds				
PA	Wetlands - Scrub/Shrub Swamps	North-Central Interior Shrub-Graminoid Alkaline Fen	9184	Central Appalachian Peatland	90 - Woody Wetlands
PA	Wetlands - Scrub/Shrub Swamps	Laurentian-Acadian Alkaline Fen	9198	Northern Peatland	90 - Woody Wetlands
PA	Wetlands - Scrub/Shrub Swamps	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
PA	Wetlands - Scrub/Shrub Swamps	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
PA	Wetlands - Scrub/Shrub Swamps	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
PA	Wetlands - Scrub/Shrub Swamps	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
PA	Wetlands - Scrub/Shrub Swamps	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
RI	Agricultural and Maintained Open Lands - Agricultural Cropland Hay	Cultivated Crops	82	Agricultural	82 - Cultivated Crops
RI	Agricultural and Maintained Open Lands - Agricultural Cropland Hay	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
RI	Agricultural and Maintained Open Lands - Agricultural Grazing	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
RI	Agricultural and Maintained Open Lands - Agricultural Land Unspecified	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub
RI	Agricultural and Maintained Open Lands - Agricultural Land Unspecified	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
RI	Agricultural and Maintained Open Lands - Agricultural Land Unspecified	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
RI	Agricultural and Maintained Open Lands - Idle Agriculture	Cultivated Crops	82	Agricultural	82 - Cultivated Crops
RI	Deciduous Forests - Deciduous Forest Beech-Maple	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
RI	Deciduous Forests - Deciduous Forest Oak/Heath	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
RI	Deciduous Forests - Deciduous Forest Oak/Heath	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
RI	Deciduous Forests - Deciduous Forest Oak/Holly	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
RI	Deciduous Forests - Deciduous Forest Oak-Hickory	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
RI	Deciduous Forests - Deciduous Forest Oak-Hickory	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
RI	Deciduous Forests - Deciduous Forest Unspecified	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
RI	Early Successional Habitats - Coastal Shrubland	Northern Atlantic Coastal Plain Heathland and Grassland	5275	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
RI	Early Successional Habitats - Maritime Grassland	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
RI	Emergent Wetlands - Coastal Plain Pondshore	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
RI	Emergent Wetlands - Coastal Plain Quagmire	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
RI	Emergent Wetlands - Emergent Fen/Bog	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
RI	Emergent Wetlands - Emergent Marsh Deep	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
RI	Emergent Wetlands - Emergent Marsh Shallow/ Wet Meadow	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
RI	Emergent Wetlands - Freshwater Wetland Unspecified	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
RI	Emergent Wetlands - Freshwater Wetland Unspecified	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
RI	Evergreen Forests - Evergreen Forest Hemlock	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
RI	Evergreen Forests - Evergreen Forest Pine	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
RI	Evergreen Forests - Evergreen Forest Red Cedar	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
RI	Evergreen Forests - Evergreen Forest Spruce (Plantation)	Managed Tree Plantation	8513	Plantation and Ruderal Forest	42 - Evergreen Forest
RI	Evergreen Forests - Evergreen Forest Unspecified	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
RI	Forested Wetlands - Forested Coniferous Wetland Unspecified				
RI	Forested Wetlands - Forested Coniferous Wetland White Cedar	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
RI	Forested Wetlands - Forested Deciduous Red Maple Swamp	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
RI	Forested Wetlands - Forested Deciduous Wetland Unspecified	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
RI	Forested Wetlands - Forested Deciduous Wetland Unspecified	North-Central Interior and Appalachian Rich Swamp	9306	Northern Swamp	90 - Woody Wetlands
RI	Intertidal - Estuarine Beaches Unspecified	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
RI	Intertidal - Estuarine Bluff Clay	Northeastern Erosional Bluff	3114	Cliff and Talus	31 - Barren Land
RI	Intertidal - Estuarine Intertidal Emergent Brackish Marsh	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
RI	Intertidal - Estuarine Intertidal Emergent Brackish Marsh	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
RI	Intertidal - Estuarine Rocky Shore Bedrock	North Atlantic Rocky Intertidal	3190	Intertidal Shore	
RI	Mixed Forests - Forest Unspecified	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
RI	Mixed Forests - Forest Unspecified	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
RI	Mixed Forests - Mixed Forest Deciduous Unspecified	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
RI	Mixed Forests - Mixed Forest Evergreen Unspecified	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
RI	Pitch Pine Communities - Evergreen Forest Pitch Pine/Scrub Oak Barren	Northern Atlantic Coastal Plain Pitch Pine Barrens	4258	Central Oak-Pine	42 - Evergreen Forest
RI	Pitch Pine Communities - Evergreen Forest Pitch Pine-Oak Barren	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
RI	Predator-free Islands	n/a			
RI	Shrub Wetlands - Shrub Bog Unspecified	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub
RI	Shrub Wetlands - Shrub Bog Unspecified	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
RI	Shrub Wetlands - Shrub Swamp Alder	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
RI	Shrub Wetlands - Shrub Swamp Water Willow	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
RI	Sparsely Vegetated Habitats - Barren Land Unspecified	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
RI	Sparsely Vegetated Habitats - Beach Grass Dune	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
RI	Sparsely Vegetated Habitats - Freshwater Beaches	Laurentian-Acadian Lakeshore Beach	3182	Lake & River Shoreline	32 - Unconsolidated Shore
RI	Sparsely Vegetated Habitats - Gravel Pits and Quarries	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
RI	Sparsely Vegetated Habitats - Inland Dune / Cobble	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
RI	Sparsely Vegetated Habitats - Inland Dune/ Sand Barren	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
RI	Sparsely Vegetated Habitats - Natural Quartz Rock Outcrops	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
RI	Urban Habitats	Residential - Low Intensity	22	Urban & Residential	22 - Developed, Low Intensity
RI	Urban Habitats	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
RI	Urban Habitats	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
RI	Urban Habitats	Residential - Medium Intensity	22	Urban & Residential	22 - Developed, Low Intensity
RI	Urban Habitats	Commercial/Industrial	24	Urban & Residential	24 - Developed, High Intensity
RI	Urban Habitats	Residential - High Intensity	23	Urban & Residential	23 - Developed, Medium Intensity
VA	Barren Habitat - Balds	Cumberland Acidic Cliff and Rockhouse	3119	Cliff and Talus	31 - Barren Land
VA	Barren Habitat - Balds	Southern Appalachian Granitic Dome	3126	Summit/Flatrock	31 - Barren Land

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VA	Barren Habitat - Balds	Southern Appalachian Montane Cliff and Talus	3186	Cliff and Talus	31 - Barren Land
VA	Barren Habitat - Balds	Southern Interior Calcareous Cliff	3185	Cliff and Talus	31 - Barren Land
VA	Barren Habitat - Balds	Southern Piedmont Cliff	3156	Cliff and Talus	31 - Barren Land
VA	Barren Habitat - Balds	Southern Appalachian Grass and Shrub Bald	7127	Outcrop/Summit Scrub	52 - Scrub/Shrub
VA	Barren Habitat - Beach	Northern Atlantic Coastal Plain Sandy Beach	3124	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
VA	Barren Habitat - Beach	Northern Atlantic Coastal Plain Dune and Maritime Grassland	7149	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
VA	Barren Habitat - Developed	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
VA	Barren Habitat - Developed	Residential - Medium Intensity	22	Urban & Residential	22 - Developed, Low Intensity
VA	Barren Habitat - Developed	Residential - Low Intensity	22	Urban & Residential	22 - Developed, Low Intensity
VA	Barren Habitat - Developed	Introduced Shrubland	8402	Ruderal Shrubland & Grassland	52 - Scrub/Shrub
VA	Barren Habitat - Developed	Cultivated Crops	82	Agricultural	82 - Cultivated Crops
VA	Barren Habitat - Developed	Commercial/Industrial	24	Urban & Residential	24 - Developed, High Intensity
VA	Barren Habitat - Developed	Residential - High Intensity	23	Urban & Residential	23 - Developed, Medium Intensity
VA	Barren Habitat - Developed	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
VA	Barren Habitat - Developed	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
VA	Barren Habitat - Other Barren	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land
VA	Forest Habitat - Coniferous Forest	Atlantic Coastal Plain Upland Longleaf Pine Woodland	4250	Longleaf Pine	42 - Evergreen Forest
VA	Forest Habitat - Coniferous Forest	Central and Southern Appalachian Spruce-Fir Forest	4253	Boreal Upland Forest	42 - Evergreen Forest
VA	Forest Habitat - Coniferous Forest	Southern Appalachian Low-Elevation Pine Forest	4256	Southern Oak-Pine	42 - Evergreen Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VA	Forest Habitat - Coniferous Forest	Southern Appalachian Montane Pine Forest and Woodland	4255	Central Oak-Pine	42 - Evergreen Forest
VA	Forest Habitat - Coniferous Forest	Central Atlantic Coastal Plain Maritime Forest	4264	Southern Oak-Pine	42 - Evergreen Forest
VA	Forest Habitat - Coniferous Forest	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
VA	Forest Habitat - Coniferous Forest	Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoods	9118	Longleaf Pine	42 - Evergreen Forest
VA	Forest Habitat - Coniferous Forest	Managed Tree Plantation	8513	Plantation and Ruderal Forest	42 - Evergreen Forest
VA	Forest Habitat - Deciduous Forest	Southern and Central Appalachian Cove Forest	4124	Northern Hardwood & Conifer	43 - Mixed Forest
VA	Forest Habitat - Deciduous Forest	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Southern Ridge and Valley / Cumberland Dry Calcareous Forest	4319	Central Oak-Pine	43 - Mixed Forest
VA	Forest Habitat - Deciduous Forest	Allegheny-Cumberland Dry Oak Forest and Woodland	4123	Central Oak-Pine	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Southern Appalachian Northern Hardwood Forest	4115	Northern Hardwood & Conifer	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Southern Appalachian Oak Forest	4121	Central Oak-Pine	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
VA	Forest Habitat - Deciduous Forest	Central and Southern Appalachian Montane Oak Forest	4126	Central Oak-Pine	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Northern Atlantic Coastal Plain Hardwood Forest	4130	Central Oak-Pine	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	South-Central Interior Mesophytic Forest	4127	Northern Hardwood & Conifer	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Southern Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest	4141	Central Oak-Pine	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Piedmont Hardpan Woodland and Forest	4149	Central Oak-Pine	41 - Deciduous Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VA	Forest Habitat - Deciduous Forest	Northern Atlantic Coastal Plain Calcareous Ravine	4156	Central Oak-Pine	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Southern Atlantic Coastal Plain Mesic Hardwood Forest	4150	Northern Hardwood & Conifer	41 - Deciduous Forest
VA	Forest Habitat - Deciduous Forest	Southern Piedmont Mesic Forest	4122	Northern Hardwood & Conifer	41 - Deciduous Forest
VA	Forest Habitat - Mixed Forest	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
VA	Forest Habitat - Mixed Forest	Southern Piedmont Dry Oak-(Pine) Forest	4311	Central Oak-Pine	41 - Deciduous Forest
VA	Forest Habitat - Mixed Forest	Appalachian Shale Barrens	4147	Central Oak-Pine	43 - Mixed Forest
VA	Forest Habitat - Mixed Forest	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
VA	Forest Habitat - Mixed Forest	Appalachian Serpentine Woodland	4318	Central Oak-Pine	43 - Mixed Forest
VA	Forest Habitat - Mixed Forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
VA	Forest Habitat - Mixed Forest	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
VA	Forest Habitat - Mixed Forest	Northern Atlantic Coastal Plain Maritime Forest	4322	Central Oak-Pine	43 - Mixed Forest
VA	Forest Habitat - Mixed Forest	Southern and Central Appalachian Mafic Glade and Barrens	5415	Glade and Savanna	72 - Grassland/Herbaceous
VA	Forest Habitat - Mixed Forest	Cumberland Sandstone Glade and Barrens	5414	Glade and Savanna	72 - Grassland/Herbaceous
VA	Forest Habitat - Mixed Forest	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
VA	Forest Habitat - Mixed Forest	Southern Piedmont Glade and Barrens	5412	Glade and Savanna	72 - Grassland/Herbaceous
VA	Forest Habitat - Mixed Forest	Southern Ridge and Valley Calcareous Glade and Woodland	5464	Glade and Savanna	72 - Grassland/Herbaceous

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VA	Forest Habitat - Mixed Forest	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
VA	Forest Habitat - Mixed Forest	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
VA	Open Vegetated Habitat - Open Scrub	Introduced Upland Vegetation - Tree	8401	Exotic Upland Forest	43 - Mixed Forest
VA	Open Vegetated Habitat - Open Scrub	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
VA	Open Vegetated Habitat - Open Scrub	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
VA	Open Vegetated Habitat - Open Vegetated	Southern Piedmont Granite Flatrock and Outcrop	3175	Summit/Flatrock	31 - Barren Land
VA	Open Vegetated Habitat - Open Vegetated	Southern Appalachian Spray Cliff	3145	Cliff and Talus	31 - Barren Land
VA	Open Vegetated Habitat - Open Vegetated	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
VA	Wetland Habitat - Emergent	Southeastern Coastal Plain Interdunal Wetland	9257	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
VA	Wetland Habitat - Emergent	Southern Appalachian Seepage Wetland	9259	Central Appalachian Peatland	90 - Woody Wetlands
VA	Wetland Habitat - Emergent	Atlantic Coastal Plain Peatland Pocosin and Canebrake	9121	Coastal Plain Peatland	90 - Woody Wetlands
VA	Wetland Habitat - Emergent	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
VA	Wetland Habitat - Emergent	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
VA	Wetland Habitat - Emergent	Atlantic Coastal Plain Embayed Region Tidal Salt and Brackish Marsh	9261	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VA	Wetland Habitat - Emergent	Northern Atlantic Coastal Plain Tidal Salt Marsh	9282	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
VA	Wetland Habitat - Emergent	Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	9293	Emergent Marsh	95 - Emergent Herbaceous Wetland
VA	Wetland Habitat - Emergent	Southern and Central Appalachian Bog and Fen	9309	Central Appalachian Peatland	90 - Woody Wetlands
VA	Wetland Habitat - Emergent	Southern Atlantic Coastal Plain Depression Pondshore	9305	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
VA	Wetland Habitat - Emergent	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
VA	Wetland Habitat - Emergent	Atlantic Coastal Plain Embayed Region Tidal Freshwater Marsh	9276	Emergent Marsh	95 - Emergent Herbaceous Wetland
VA	Wetland Habitat - Emergent	Northern Atlantic Coastal Plain Brackish Tidal Marsh	9272	Salt Marsh	96 - Palustrine Emergent Wetland (Persistent)
VA	Wetland Habitat - Forested	Atlantic Coastal Plain Small Brownwater River Floodplain Forest	9315	Southern Bottomland Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Southern Atlantic Coastal Plain Tidal Wooded Swamp	9194	Coastal Plain Swamp	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Central Appalachian Stream and Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested				
VA	Wetland Habitat - Forested	Northern Atlantic Coastal Plain Basin Peat Swamp	9343	Coastal Plain Swamp	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Central Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest	9310	Coastal Plain Swamp	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Southern Piedmont Large Floodplain Forest	9324	Southern Bottomland Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Piedmont Upland Depression Swamp	9302	Central Hardwood Swamp	90 - Woody Wetlands

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VA	Wetland Habitat - Forested	Northern Atlantic Coastal Plain Stream and River	4157	Northeastern Floodplain Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Atlantic Coastal Plain Brownwater Stream Floodplain Forest	9320	Southern Bottomland Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested	South-Central Interior Large Floodplain	9334	Northeastern Floodplain Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested	South-Central Interior Small Stream and Riparian	9335	Northeastern Floodplain Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
VA	Wetland Habitat - Forested	Southern Piedmont Small Floodplain and Riparian Forest	9312	Southern Bottomland Forest	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	9137	Coastal Plain Swamp	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Northern Atlantic Coastal Plain Calcareous Ravine	4156	Central Oak-Pine	41 - Deciduous Forest
VA	Wetland Habitat - Forested	Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest	9342	Coastal Plain Swamp	90 - Woody Wetlands
VA	Wetland Habitat - Forested	Central Interior Highlands and Appalachian Sinkhole and Depression Pond	9160	Central Hardwood Swamp	90 - Woody Wetlands
VT	Buildings and Other Structures	Residential - Low Intensity	22	Urban & Residential	22 - Developed, Low Intensity
VT	Buildings and Other Structures	Commercial/Industrial	24	Urban & Residential	24 - Developed, High Intensity
VT	Buildings and Other Structures	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space
VT	Buildings and Other Structures	Residential - Medium Intensity	22	Urban & Residential	22 - Developed, Low Intensity

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VT	Buildings and Other Structures	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
VT	Buildings and Other Structures	Residential - High Intensity	23	Urban & Residential	23 - Developed, Medium Intensity
VT	Cliffs and Talus Slopes - Boreal Acidic Cliff	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
VT	Cliffs and Talus Slopes - Boreal Calcareous Cliff	Laurentian-Acadian Calcareous Cliff and Talus	3144	Cliff and Talus	31 - Barren Land
VT	Cliffs and Talus Slopes - Open Talus	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
VT	Cliffs and Talus Slopes - Open Talus	Laurentian-Acadian Calcareous Cliff and Talus	3144	Cliff and Talus	31 - Barren Land
VT	Cliffs and Talus Slopes - Open Talus	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
VT	Cliffs and Talus Slopes - Open Talus	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
VT	Cliffs and Talus Slopes - Temperate Acidic Cliff	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
VT	Cliffs and Talus Slopes - Temperate Calcareous Cliff	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
VT	Floodplain Forests - Lakeside Floodplain Forest	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Floodplain Forests - Silver Maple-Ostrich Fern Riverine Floodplain Forest	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Floodplain Forests - Silver Maple-Sensitive Fern Riverine Floodplain Forest	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Floodplain Forests - Silver Maple-Sensitive Fern Riverine Floodplain Forest	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Floodplain Forests - Sugar Maple-Ostrich Fern Riverine Floodplain Forest	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Grasslands and Hedge Rows	Pasture/Hay	81	Agricultural	81 - Pasture/Hay

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VT	Grasslands and Hedge Rows	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
VT	Grasslands and Hedge Rows	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
VT	Hardwood Swamps - Calcareous Red Maple-Tamarack Swamp	North-Central Interior and Appalachian Rich Swamp	9306	Northern Swamp	90 - Woody Wetlands
VT	Hardwood Swamps - Red Maple-Black Ash Seepage Swamp	Laurentian-Acadian Alkaline Conifer-Hardwood Swamp	9345	Northern Swamp	90 - Woody Wetlands
VT	Hardwood Swamps - Red Maple-Northern White Cedar Swamp	Laurentian-Acadian Alkaline Conifer-Hardwood Swamp	9345	Northern Swamp	90 - Woody Wetlands
VT	Hardwood Swamps - Red Maple-Sphagnum Acidic Basin Swamp	Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp	9346	Northern Swamp	90 - Woody Wetlands
VT	Marshes and Sedge Meadows - Cattail Marsh	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
VT	Marshes and Sedge Meadows - Cattail Marsh	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
VT	Marshes and Sedge Meadows - Deep Broadleaf Marsh	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
VT	Marshes and Sedge Meadows - Deep Bulrush Marsh	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
VT	Marshes and Sedge Meadows - Sedge Meadow	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
VT	Marshes and Sedge Meadows - Shallow Emergent Marsh	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
VT	Marshes and Sedge Meadows - Wild Rice Marsh	Laurentian-Acadian Freshwater Marsh	9405	Emergent Marsh	95 - Emergent Herbaceous Wetland
VT	Mines and Quarries	Quarries/Pits/Stripmines	32	Extractive	31 - Barren Land

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VT	Northern Hardwood Forest - Hemlock Forest	Laurentian-Acadian Pine-Hemlock-Hardwood Forest	4308	Northern Hardwood & Conifer	43 - Mixed Forest
VT	Northern Hardwood Forest - Hemlock-Northern Hardwood Forest	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
VT	Northern Hardwood Forest - Mesic Red Oak-Northern Hardwood Forest	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
VT	Northern Hardwood Forest - Northern Hardwood Forest	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
VT	Northern Hardwood Forest - Northern Hardwood Talus Woodland	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
VT	Northern Hardwood Forest - Rich Northern Hardwood Forest	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
VT	Northern Hardwood Forest - White Pine-Northern Hardwood Forest	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest
VT	Oak-Pine-Northern Hardwood Forest - Dry Oak Forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
VT	Oak-Pine-Northern Hardwood Forest - Dry Oak Woodland	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
VT	Oak-Pine-Northern Hardwood Forest - Dry Oak-Hickory-Hophornbeam Forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
VT	Oak-Pine-Northern Hardwood Forest - Limestone Bluff Cedar-Pine Forest	Laurentian-Acadian Calcareous Rocky Outcrop	5461	Outcrop/Summit Scrub	52 - Scrub/Shrub
VT	Oak-Pine-Northern Hardwood Forest - Mesic Maple-Ash-Hickory-Oak Forest	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
VT	Oak-Pine-Northern Hardwood Forest - Pine-Oak-Heath Sandplain Forest	Northeastern Interior Pine Barrens	4257	Central Oak-Pine	42 - Evergreen Forest
VT	Oak-Pine-Northern Hardwood Forest - Pine-Oak-Heath Sandplain Forest	Laurentian-Acadian Northern Pine-(Oak) Forest	4265	Northern Hardwood & Conifer	42 - Evergreen Forest
VT	Oak-Pine-Northern Hardwood Forest - Pitch Pine-Oak-Heath Rocky Summit	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
VT	Oak-Pine-Northern Hardwood Forest - Red Cedar Woodland	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
VT	Oak-Pine-Northern Hardwood Forest - Red Pine Forest or Woodland	Laurentian-Acadian Northern Pine-(Oak) Forest	4265	Northern Hardwood & Conifer	42 - Evergreen Forest
VT	Oak-Pine-Northern Hardwood Forest - Transition Hardwood Talus Woodland	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VT	Oak-Pine-Northern Hardwood Forest - Valley Clayplain Forest	North-Central Interior Wet Flatwoods	9186	Central Hardwood Swamp	90 - Woody Wetlands
VT	Oak-Pine-Northern Hardwood Forest - White Pine-Red Oak-Black Oak Forest	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
VT	Open Peatlands - Alpine Peatland	Acadian-Appalachian Subalpine Woodland and Heath-Krummholz	5320	Alpine	52 - Scrub/Shrub
VT	Open Peatlands - Black Spruce Woodland Bog	Boreal-Laurentian Bog	9354	Northern Peatland	90 - Woody Wetlands
VT	Open Peatlands - Dwarf Shrub Bog	Boreal-Laurentian Bog	9354	Northern Peatland	90 - Woody Wetlands
VT	Open Peatlands - Dwarf Shrub Bog	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
VT	Open Peatlands - Intermediate Fen	Laurentian-Acadian Alkaline Fen	9198	Northern Peatland	90 - Woody Wetlands
VT	Open Peatlands - Pitch Pine Woodland Bog	North-Central Interior and Appalachian Acidic Peatland	9193	Northern Peatland	90 - Woody Wetlands
VT	Open Peatlands - Poor Fen	Boreal-Laurentian-Acadian Acidic Basin Fen	9353	Northern Peatland	90 - Woody Wetlands
VT	Open Peatlands - Rich Fen	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
VT	Outcrops and Upland Meadows - Alpine Meadows	Acadian-Appalachian Alpine Tundra	5210	Alpine	52 - Scrub/Shrub
VT	Outcrops and Upland Meadows - Boreal Outcrop	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
VT	Outcrops and Upland Meadows - Serpentine Outcrop	Northern Appalachian-Acadian Rocky Heath Outcrop	5462	Outcrop/Summit Scrub	52 - Scrub/Shrub
VT	Outcrops and Upland Meadows - Temperate Acidic Outcrop	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
VT	Outcrops and Upland Meadows - Temperate Calcareous Outcrop	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
VT	Shrub Swamps - Alder Swamp	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VT	Shrub Swamps - Alder Swamp	Laurentian-Acadian Wet Meadow-Shrub Swamp	9406	Wet Meadow / Shrub Marsh	95 - Emergent Herbaceous Wetland
VT	Shrub Swamps - Alluvial Shrub Swamp	Central Appalachian Stream and Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Shrub Swamps - Alluvial Shrub Swamp	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Shrub Swamps - Buttonbush Swamp	Boreal-Laurentian-Acadian Acidic Basin Fen	9353	Northern Peatland	90 - Woody Wetlands
VT	Shrub Swamps - Sweet Gale Shoreline Swamp	Boreal-Laurentian-Acadian Acidic Basin Fen	9353	Northern Peatland	90 - Woody Wetlands
VT	Softwood Swamps - Black Spruce Swamp	Boreal-Laurentian Conifer Acidic Swamp	9177	Boreal Forested Peatland	90 - Woody Wetlands
VT	Softwood Swamps - Hemlock Swamp	North-Central Appalachian Acidic Swamp	9307	Northern Swamp	90 - Woody Wetlands
VT	Softwood Swamps - Northern White Cedar Swamp	Acadian-Appalachian Conifer Seepage Forest	9344	Northern Swamp	90 - Woody Wetlands
VT	Softwood Swamps - Northern White Cedar Swamp	Laurentian-Acadian Alkaline Conifer-Hardwood Swamp	9345	Northern Swamp	90 - Woody Wetlands
VT	Softwood Swamps - Spruce-Fir-Tamarack Swamp	Boreal-Laurentian Conifer Acidic Swamp	9177	Boreal Forested Peatland	90 - Woody Wetlands
VT	Spruce-Fir-Northern Hardwood Forest - Boreal Talus Woodlands	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
VT	Spruce-Fir-Northern Hardwood Forest - Cold-Air Talus Woodland	Laurentian-Acadian Acidic Cliff and Talus	3188	Cliff and Talus	31 - Barren Land
VT	Spruce-Fir-Northern Hardwood Forest - Lowland Spruce-Fir Forest	Acadian Sub-Boreal Spruce Barrens	9133	Boreal Upland Forest	42 - Evergreen Forest
VT	Spruce-Fir-Northern Hardwood Forest - Lowland Spruce-Fir Forest	Acadian Low-Elevation Spruce-Fir Forest and Flats	4316	Boreal Upland Forest	42 - Evergreen Forest
VT	Spruce-Fir-Northern Hardwood Forest - Montane Spruce-fir Forest	Acadian-Appalachian Montane Spruce-Fir Forest	4317	Boreal Upland Forest	42 - Evergreen Forest
VT	Spruce-Fir-Northern Hardwood Forest - Montane Yellow Birch-Red Spruce Forest	Acadian-Appalachian Montane Spruce-Fir Forest	4317	Boreal Upland Forest	42 - Evergreen Forest
VT	Spruce-Fir-Northern Hardwood Forest - Red Spruce-Northern Hardwood Forest	Laurentian-Acadian Northern Hardwoods Forest	4108	Northern Hardwood & Conifer	41 - Deciduous Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
VT	Spruce-Fir-Northern Hardwood Forest - Subalpine Krummholz	Acadian-Appalachian Subalpine Woodland and Heath-Krummholz	5320	Alpine	52 - Scrub/Shrub
VT	Upland Shores - Erosional river bluff	Central Appalachian Stream and Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Upland Shores - Lake or shale cobble beach	Laurentian-Acadian Lakeshore Beach	3182	Lake & River Shoreline	32 - Unconsolidated Shore
VT	Upland Shores - Lake sand beach	Laurentian-Acadian Lakeshore Beach	3182	Lake & River Shoreline	32 - Unconsolidated Shore
VT	Upland Shores - Riverside outcrop	Central Appalachian Stream and Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Upland Shores - Riverside outcrop	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Upland Shores - Sand dune	Great Lakes Dune and Swale	9135	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
VT	Vernal Pools and Seeps	n/a, inclusion in forest habitat systems			
VT	Wet Shores - Calcareous riverside seep	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Wet Shores - Lakeshore grassland	Great Lakes Dune	3137	Coastal Grassland & Shrubland	72 - Grassland/Herbaceous
VT	Wet Shores - Outwash plain pondshore	Northern Atlantic Coastal Plain Pond	9283	Coastal Plain Pond	95 - Emergent Herbaceous Wetland
VT	Wet Shores - River cobble shore	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Wet Shores - River mud shore	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Wet Shores - River sand or gravel shore	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
VT	Wet Shores - Rivershore grassland	Laurentian-Acadian Floodplain Systems	9144	Northeastern Floodplain Forest	90 - Woody Wetlands
WV	Anthropogenic Grassland	Residential - Rural / Sparse	21	Urban & Residential	21 - Developed, Open Space

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
WV	Anthropogenic Grassland	Pasture/Hay	81	Agricultural	81 - Pasture/Hay
WV	Anthropogenic Grassland	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
WV	Anthropogenic Grassland	Urban & Recreational Grasses	21	Maintained Grasses and Mixed Cover	21 - Developed, Open Space
WV	Calcareous Forests and Woodlands	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
WV	Calcareous Forests and Woodlands	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
WV	Calcareous Forests and Woodlands	Southern Ridge and Valley / Cumberland Dry Calcareous Forest	4319	Central Oak-Pine	43 - Mixed Forest
WV	Dry Rocky Pine/Oak Forests and Woodlands	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest
WV	Dry Rocky Pine/Oak Forests and Woodlands	Central Appalachian Pine-Oak Rocky Woodland	4320	Central Oak-Pine	43 - Mixed Forest
WV	Dry Rocky Pine/Oak Forests and Woodlands	Southern Appalachian Montane Pine Forest and Woodland	4255	Central Oak-Pine	42 - Evergreen Forest
WV	Floodplain Forests and Swamps	Central Interior Highlands and Appalachian Sinkhole and Depression Pond	9160	Central Hardwood Swamp	90 - Woody Wetlands
WV	Floodplain Forests and Swamps	South-Central Interior Large Floodplain	9334	Northeastern Floodplain Forest	90 - Woody Wetlands
WV	Floodplain Forests and Swamps	Central Appalachian River Floodplain	9333	Northeastern Floodplain Forest	90 - Woody Wetlands
WV	Floodplain Forests and Swamps	Introduced Wetland and Riparian Vegetation - Mixed	8411	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
WV	Forest Seeps and Vernal Pools	n/a, inclusion in forest habitat systems			
WV	Heath/Grass Barrens and Balds	Southern Appalachian Grass and Shrub Bald	7127	Outcrop/Summit Scrub	52 - Scrub/Shrub

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
WV	Heath/Grass Barrens and Balds	Powerline Right-of-Way	8302	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
WV	Hemlock forests	Appalachian (Hemlock)-Northern Hardwood Forest	4313	Northern Hardwood & Conifer	43 - Mixed Forest
WV	High Allegheny Bogs and Fens	High Allegheny Wetland	9356	Northern Swamp	90 - Woody Wetlands
WV	High Allegheny Swamp	High Allegheny Wetland	9356	Northern Swamp	90 - Woody Wetlands
WV	Hill Country Deciduous Forests	Allegheny-Cumberland Dry Oak Forest and Woodland	4123	Central Oak-Pine	41 - Deciduous Forest
WV	Hill Country Deciduous Forests	South-Central Interior Mesophytic Forest	4127	Northern Hardwood & Conifer	41 - Deciduous Forest
WV	Hill Country Deciduous Forests	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
WV	Limestone Barrens and Glades	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
WV	Marshes and Wet Meadows	Modified/Managed Marsh	8511	Modified/Managed Marsh	95 - Emergent Herbaceous Wetland
WV	Marshes and Wet Meadows	North-Central Appalachian Seepage Fen	9232	Central Appalachian Peatland	90 - Woody Wetlands
WV	Mixed Mesophytic Forest	South-Central Interior Mesophytic Forest	4127	Northern Hardwood & Conifer	41 - Deciduous Forest
WV	Mixed Mesophytic Forest	Southern and Central Appalachian Cove Forest	4124	Northern Hardwood & Conifer	43 - Mixed Forest
WV	Northern Hardwoods Forest	Southern Appalachian Northern Hardwood Forest	4115	Northern Hardwood & Conifer	41 - Deciduous Forest
WV	Oak/Heath and Oak/White Pine Forests	Central and Southern Appalachian Montane Oak Forest	4126	Central Oak-Pine	41 - Deciduous Forest
WV	Oak/Heath and Oak/White Pine Forests	Southern Appalachian Oak Forest	4121	Central Oak-Pine	41 - Deciduous Forest
WV	Oak/Heath and Oak/White Pine Forests	Central Appalachian Dry Oak-Pine Forest	4312	Central Oak-Pine	43 - Mixed Forest

state	SWAP Habitat Unit (excluding aquatic)	NETHCS HABITAT SYSTEM	ESLF	Macrogroup	NLCD
WV	Oak/Hickory and Dry/Mesic Oak Forest	Northeastern Interior Dry-Mesic Oak Forest	4109	Central Oak-Pine	41 - Deciduous Forest
WV	Old Fields	Ruderal Upland - Old Field	8301	Ruderal Shrubland & Grassland	52 - Scrub/Shrub OR 72 - Grassland/Herbaceous
WV	Red Spruce Forests	Central and Southern Appalachian Spruce-Fir Forest	4253	Boreal Upland Forest	42 - Evergreen Forest
WV	Riverscour Communities	Central Appalachian Stream and Riparian	9331	Northeastern Floodplain Forest	90 - Woody Wetlands
WV	Riverscour Communities	South-Central Interior Small Stream and Riparian	9335	Northeastern Floodplain Forest	90 - Woody Wetlands
WV	Rock Outcrops/Cliffs/Talus	Cumberland Acidic Cliff and Rockhouse	3119	Cliff and Talus	31 - Barren Land
WV	Rock Outcrops/Cliffs/Talus	Southern Appalachian Spray Cliff	3145	Cliff and Talus	31 - Barren Land
WV	Rock Outcrops/Cliffs/Talus	North-Central Appalachian Circumneutral Cliff and Talus	3153	Cliff and Talus	31 - Barren Land
WV	Rock Outcrops/Cliffs/Talus	North-Central Appalachian Acidic Cliff and Talus	3154	Cliff and Talus	31 - Barren Land
WV	Sandstone Glades	Central Appalachian Alkaline Glade and Woodland	5416	Glade and Savanna	72 - Grassland/Herbaceous
WV	Shale Barrens	Appalachian Shale Barrens	4147	Central Oak-Pine	43 - Mixed Forest
WV	Successional Conifer Forests and Woodlands	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest
WV	Successional Deciduous Forest	Ruderal Forest - Northern and Central Hardwood and Conifer	8303	Plantation and Ruderal Forest	43 - Mixed Forest

Northeast Habitat Classification and Mapping Project
Northeast Terrestrial Wildlife Habitat Classification System
USER GUIDE

Background:

With the creation of State Wildlife Action Plans, the need for consistent, current digital habitat maps has become increasingly apparent. The implementation of the Wildlife Action Plans within each state and across the Northeast region will be greatly enhanced through the development of current, consistent terrestrial and aquatic habitat GIS datasets. However, first a common way to describe and classify aquatic and terrestrial habitats is needed. This project will compile and standardize terrestrial and aquatic habitat classification systems and provide initial map products that will form the foundation of state and regional conservation in the Northeastern United States. Financial support is provided through the Doris Duke Charitable Foundation through the National Fish and Wildlife Foundation. Each of the 14 jurisdictions (including D.C.) are participating and contributing in-kind support.
For more information on this project, please see our website on the Regional Conservation Needs page: **http://www.rcngrants.org/content/northeastern-wildlife-habitat-classification-and-mapping-project**

The terrestrial classification has been designed for maximum compatibility with existing habitat classification efforts in the northeast that are being undertaken by LANDFIRE and (soon) by the Gap Analysis Program. We used the existing GAP/LANDFIRE national legend, filtered for the region, as the starting point. This structure is based on NatureServe's Ecological Systems and expanded to include semi-natural and cultural land types and other wildlife habitat not currently covered by, or under-represented in, the Ecological Systems classification. The habitat classification is hierarchical so it can be scaled to different applications. Some users may want detail available at the level of the "habitat system", corresponding to Ecological Systems (e.g. North-Central Appalachian Acidic Swamp vs. North-Central Interior and Appalachian Rich Swamp vs. High Allegheny Wetland) while other users may be interested in a broader treatment (e. g. treating any of those as a Northern Swamp, the macrogroup level). Still other users, particularly those at a local level, may want detail finer than that offered by a habitat system, and a set of structural modifiers has been added to address those needs.

Northeast Terrestrial Wildlife Habitat Classification System structure:

The NETWHCS is a flexible framework for characterizing wildlife habitat that works on two levels – **habitat systems** and **structural modifiers**. The basic layer is the **habitat system** (blue column in the accompanying excel sheet). These correspond to the *ecological system* units developed by NatureServe, with additional systems for altered habitats and land-use types. The resulting set of 142 habitat systems is congruent with the units being mapped across the northeast for LANDFIRE, and will be coordinated with the approach used in future mapping of the northeast by the Gap Analysis Program.

Based on input from the steering committee, we chose a hierarchical organizing system for the habitat systems consistent with the FGDC vegetation standard.
It uses levels from the National Vegetation Classification revised hierarchy, which has been accepted as an FGDC standard (Federal Geographic Data Committee 2008, http://www.fgdc.gov/standards/projects/FGDC-standards-projects/vegetation/). The Formation level, the highest grouping level, uses very broad categories (e.g., Northeastern Upland Forest). We added the Macrogroup level as a second grouping variable, and the draft habitat systems are assigned to those 36 macrogroups (yellow column in the accompanying excel sheet)[1]. Each Formation contains one or more (generally more) macrogroups, and each macrogroup contains one or more (generally more) habitat systems[2].

Example of the NVC hierarchy as applied to habitat systems in this classification:		
Formation	***Macrogroup***	***Habitat System***
Northeastern Upland Forest	Central Oak-Pine Forest	Northeastern Interior Dry-Mesic Oak Forest

The habitat systems are hierarchically arranged by Formation Class, Formation, Macrogroup, and Habitat System. For example, a dry oak-pine forest habitat in Pennsylvania would be:

Forest and Woodland Formation Class (I)
Northeastern Upland Forest Formation (I.C.2)
Central Oak-Pine Forest Macrogroup
Central Appalachian Dry Oak-Pine Forest habitat system

[1] Macrogroup (from the FGDC standard): "defined by combinations of moderate sets of diagnostic plant species and diagnostic growth forms that reflect biogeographic differences in composition and sub-continental to regional differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes".

[2] The FGDC standard addresses the National Vegetation Classification, and Ecological Systems technically are not part of that hierarchy. The concept of ecological systems as meso-scale mapping units that can incorporate physiognomic variability requires that they sit alongside the vegetation hierarchy rather than nest uniformly within it. However, in application we have found that ecological systems generally fit within Macrogroups, and as a matter of utility that approach is followed here.

Many, if not most, habitat systems can incorporate substantial variation in vegetative species dominance, successional stage, and other characteristics that are relevant to wildlife use. To address this, the classification superimposes a set of **structural modifiers** that can be applied to any particular area on the landscape to better characterize its habitat values. Structural modifiers (detailed in the accompanying Excel sheet) include variables such as canopy cover, developmental stage, herb vs shrub dominance in grasslands, evergreen vs deciduous cover, etc.

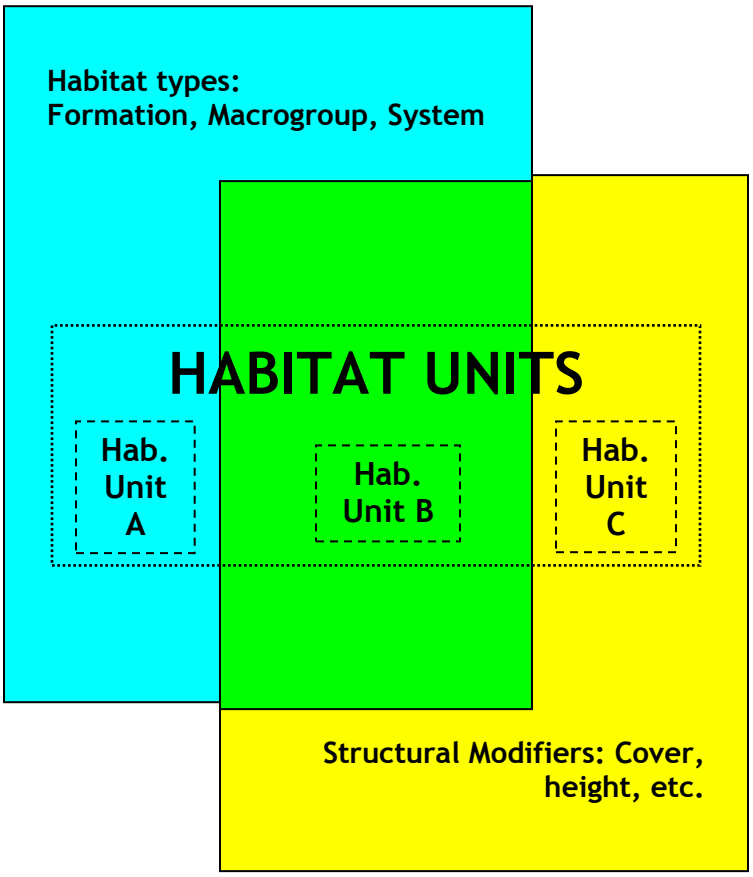

Figure 1. Schematic of the terrestrial habitat classification structure.

The combination of habitat system with structural modifiers (Figure 1) provides a powerful tool for assessing habitat. One could assess the extent of Dry Oak-Pine Forest habitat across the region as potential habitat for a species guild (see habitat unit "A" in Figure 1), or at a structural level one could assess the extent of upland shrublands (see habitat unit "C" in Figure 1). At a more detailed level of species management, a person interested in habitat for pine warbler, for example, would start with the Laurentian-Acadian Northern Pine-(Oak) Forest habitat system, and given that the birds prefer mature pines for breeding, could then filter that selection according to developmental stage (mature or older) to arrive at a selection of habitat units on the landscape that represent potential habitat for pine warbler (see habitat unit "B" in figure 1). This habitat

unit can be represented as *Laurentian-Acadian Northern Pine-(Oak) Forest [stage: >= mature]*. Thus the flexibility in this system derives from the various ways users can characterize habitats or (eventually) query a map[3]. As another example, someone interested in habitat for magnolia warbler, which typically nests in young evergreens (particularly spruce), would not necessarily need to deal with habitat type at its finest level, since several coniferous ecological systems could provide breeding habitat, but could instead use the macrogroup level Boreal Upland Forest and then filter that by canopy cover (to select open stands) and/or developmental stage (to select younger stands). This habitat unit (another example of unit "B" in Figure 1) could be represented as *Boreal Upland Forest Macrogroup [cover: open/partial, stage: <=pole]*.

The combination of Habitat Systems and Structural Modifiers does not encompass all variation used to characterize wildlife habitats, but does address much of the variation of interest for a regional classification. At a finer level, one could add lists of *habitat elements* (sensu O'Neil et al. 2003): fine-scale attributes that can determine suitability of a particular area for a particular species or group of species. Examples of habitat elements include coarse or fine woody debris, snags, litter, mast, surface characteristics, fine-scale hydrology such as vernal pools or seeps, etc. The Habitat Systems and Structural Modifiers used in this classification are generally discernable from satellite imagery or airphotos; *habitat elements* are at a scale that generally requires on-the-ground work to assess. For applications requiring that level of detail, we envision the classification presented here as providing a useful superstructure.

Scale and resolution:

The classification went through three draft iterations prior to this final version. The version presented at the September 2007 meeting of the Northeast Wildlife Diversity Technical Committee at the National Conservation Training Center was the first iteration; the second version circulated in October 2007; and the near-final draft circulated in April 2008. The first two drafts changed considerably based on the feedback received. With the addition of the structural modifiers, this classification can be applied at a finer resolution than the regional LANDFIRE and GAP approaches, and we have latitude within this project to make composite units within this framework if such units would be more useful.

Different habitats occur at different scales: a northern hardwood forest may cover thousands of hectares, while a depression pond may cover less than one hectare. This presents challenges for both classification and mapping. Many small-patch systems will not be mappable at a regional scale, but many have important wildlife habitat implications. Thus, it is important to include them in the classification while recognizing that many will not be addressed by a regional map. The classification includes the landscape pattern of each (non-altered) habitat system as Matrix, Large Patch, Small Patch, or Linear.

[3] The present project develops the terrestrial classification but does not produce a map of the habitat types. A follow-up project will map those across the northeast, with structural modifier variables added as available.

Categories for patch types used to describe ecological systems from Comer et al. 2003, *Ecological Systems of the United States,* see http://www.natureserve.org/publications/library.jsp#nspubs
Matrix Ecological Systems that form extensive and contiguous cover, occur on the most extensive landforms, and typically have wide ecological tolerances. Disturbance patches typically occupy a relatively small percentage (e.g. <5%) of the total occurrence. In undisturbed conditions, typical occurrences range in size from 2,000 to 10,000s ha.
Large Patch Ecological Systems that form large areas of interrupted cover and typically have narrower ranges of ecological tolerances than matrix types. Individual disturbance events tend to occupy patches that can encompass a large proportion of the overall occurrence (e.g. >20%). Given common disturbance dynamics, these types may tend to shift somewhat in location within large landscapes over time spans of several hundred years. In undisturbed conditions, typical occurrences range from 50-2,000 ha.
Small patch Ecological Systems that form small, discrete areas of vegetation cover typically limited in distribution by localized environmental features. In undisturbed conditions, typical occurrences range from 1-50 ha.
Linear Ecological Systems that occur as linear strips. They are often ecotonal between terrestrial and aquatic ecosystems. In undisturbed conditions, typical occurrences range in linear distance from 0.5 to 100 km.

Classification Organization:

With 143 habitat systems grouped into 35 macrogroups in the classification, organization is an important consideration. The second grouping variable in this structure is regional biogeography. We use the Ecological Divisions[4] that are used in the distributions of NatureServe's Ecological Systems. The northeast intersects three divisions: 201 – Laurentian – Acadian Division; 202 – Central Interior and Appalachian Division; and 203 – Gulf and Atlantic Coastal Plain Division (see map in spreadsheet file). With the exception of cultural or altered habitat types, each habitat system has one division that is central to its concept (though it may occur in neighboring divisions). Within each macrogroup, the habitat systems are ordered by their "home" division[5]; thus all coastal

[4] Ecological Division (from NatureServe Explorer "Sources" page): "Ecological Divisions are sub-continental landscapes reflecting both climate and biogeographic history. Continent-scaled climatic variation, reflecting variable humidity and seasonality (e.g. Mediterranean vs. dry continental vs. humid oceanic) are reflected in these units, as are broad patterns in phytogeography. The division lines were modified by using ecoregions established by The Nature Conservancy and World Wildlife Fund throughout the Western Hemisphere. All ecological systems are attributed to one or more ecological divisions, and the names of the systems include the divisional 'center of distribution'.

[5] A few boreal systems that extend into the northernmost northeast US have a Subarctic home division (denoted by "103" in the system code); for this classification, these are grouped into the "201" (Laurentian - Acadian) division.

plain systems are grouped together, all Appalachian systems are grouped together, and all Laurentian-Acadian systems are grouped together.

A few summary statistics on these 143 units:

Distribution by state (including questionable attributions)-

VA	WV	DC	MD	DE	NJ	PA	NY	CT	MA	RI	VT	NH	ME
95	43	22	59	38	33	65	80	47	62	40	56	60	61

Distribution by predominant landscape pattern-

Matrix	7
Large patch	61
Small patch	52
Linear	16
undefined (altered)	9

Distribution by NLCD class[6]-

NLCD	# of Habitat systems
21 - Developed, Open Space	2
22 - Developed, Low Intensity	2
23 - Developed, Medium Intensity	1
24 - Developed, High Intensity	1
31 - Barren Land	17
32 - Unconsolidated Shore	3
41 - Deciduous Forest	15
42 - Evergreen Forest	14
43 - Mixed Forest	11
52 - Scrub/Shrub	15
72 - Grassland/Herbaceous	6
81 - Pasture/Hay	1
82 - Cultivated Crops	1
90 - Woody Wetlands	40
95 - Emergent Herbaceous Wetland	9
96 - Palustrine Emergent Wetland (Persistent)	5

And a word about terminology:

[6] Each habitat system was assigned to the NLCD class most representative of it; however, forested systems in particular can have different expressions on the ground that would fall into different NLCD classes. For example, an area classed as Appalachian (Hemlock)-Northern Hardwood Forest might be dominated completely by northern hardwoods (NLCD 41), by hemlock (NLCD 42), or by a mixture of the two (NLCD 43)

The ecological systems on which this classification is based were developed as a means of addressing ecological variation and patterns across the United States (and other portions of the Americas), and are used in many different resource applications. Some of the language used in naming and describing these systems is fairly specific and may include terms unfamiliar to land managers and professionals in other fields ("mafic?"). The NETWHCS attempts to minimize use of jargon, but it is not completely avoidable. A glossary will accompany the final products.

Information included in the Classification (Excel workbook):

The classification is presented in an Excel workbook with seven worksheets, two of which ("HABITAT SYSTEMS DETAIL" and "MODIFIERS") are the heart of the classification:

- Overview of the classification hierarchy to macrogroup (HABITAT SYSTEMS HIERARCHY tab, first in sheet) – suggested that users start here to see all of the macrogroups on one screen.
- Classification of habitat systems (HABITAT SYSTEMS DETAIL tab) with hyperlinks to and from system description
- Structural Modifiers for habitat systems (MODIFIERS tab)
- Brief descriptions of each habitat system (Descriptions tab)
- Landscape scale/pattern (matrix, large patch, small patch) of each habitat system (part of Habitat Systems Details tab)
- State distribution of each habitat system (part of Habitat Systems Details tab). These have filters set up so it is easy to filter the sheet for just the types in one state.
- Division distribution of each habitat system (part of Habitat Systems Details tab)
- Map showing the biogeographic divisions referenced for each habitat system (Divisions Graphic tab)
- Map showing the TNC Ecoregions of the northeast, sometimes referenced in system names or descriptions (Ecoregions graphic tab)
- (ESLF # (LANDFIRE code) and NatureServe ELCODE for cross-referencing habitat systems, probably not relevant to most reviewers)
- Cross-reference from macrogroup names used in this classification to the more technical macrogroup names used in the National Vegetation Classification (Xref macrogroup names to FGDC tab).

Additional information on most of the habitat systems (all that are ecological systems) can be found on the NatureServe Explorer website, http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol

Along with the classification, a separate Excel workbook cross-references the habitat types listed in each state's Wildlife Action Plan to the regional habitat systems.