

WILDLIFE HABITAT & BIODIVERSITY DATA DEFINITIONS

Data and Source	Ranking (1-10)	Definitions
<p>GAP Ecological Systems Layer</p> <p><i>(NatureServe, The Nature Conservancy)</i></p> <p>Note: Served as primary data source for the Habitat sub-model</p>	NA	<p>This dataset was released in 2006 and provides a breakdown of ecological systems using standardized vegetation classification scheme (NatureServe 2003). Though it was re-categorized in 2006, it is based on 1998-2001 LANDSAT source imagery shot from satellite. The Gap Ecological Systems data is also used in the State Wildlife Action Plan species associations.</p>
<p>Significant Natural Heritage Areas (SNHA)</p> <p><i>NCDENR Natural Heritage Program (NHP)</i></p>	<p>Terrestrial Biodiversity Sub-Model:</p> <p>Federal or State = 10 Regional = 9 Local = 7</p>	<p>Significant Natural Heritage Areas contain known locations of rare species or rare or high quality occurrences of natural communities. Their boundaries represent the areas containing the significant rare species and natural communities within them, as well as the habitat that is necessary to maintain the rare species and the quality of the natural community. In addition to the conservation target of each SNHA, numerous other species occur, and most ecosystem functions are well supported.</p> <p>In addition to their relative significance, SNHAs are relatively precise and well-studied. Each SNHA is individually drawn by a trained ecologist after studying the area on the ground and documenting the rare species and natural communities they contain.</p> <p>SNHAs are designated as national, regional, state or county significant using parameters developed by the NC NHP, NatureServe and The Nature Conservancy to measure statewide and global rarity for rare species and communities.</p>
<p>The Nature Conservancy (TNC) Portfolio Sites</p> <p><i>The Nature Conservancy</i></p>	<p>Terrestrial Biodiversity Sub-Model</p> <p>= 8</p>	<p>The Nature Conservancy (TNC) in partnership with the Southern Appalachian Forests Coalition (SAFC) completed a study for the southern Blue Ridge, identifying portfolio sites whose protection would ensure the long-term survival of sensitive species and natural communities in the ecoregions. Sites included a selection of rare communities, species, assemblages, or larger ecological systems and includes biodiversity macro-sites.</p> <p>“Portfolio sites” are in effect shapes on the map that represent known locations of important biodiversity components and their ecological requirements. Also factored in are landscape context and potential movements of large mammal within an ecoregion and between it and other ecoregions.</p>

<p>Natural Heritage Element Occurrences (EO)</p> <p><i>NCDENR Natural Heritage Program (NHP)</i></p>	<p>Terrestrial Biodiversity Sub-Model = 6 or 7</p>	<p>Element occurrences (EO) are areas of land or water where elements of biodiversity - rare species or significant natural communities - occur. Rare species and natural communities are important and sensitive components of biodiversity.</p> <p>The most important occurrences are incorporated into SNHAs. However, other “free-standing” occurrences have additional value for viability of the elements in North Carolina. Only occurrences that are believed viable and are reasonably spatially precise and accurate are used.</p>
<p>Important Bird Areas (IBA)</p> <p><i>Audubon Society</i></p>	<p>Terrestrial Biodiversity Sub-Model = 6</p>	<p>Important Bird Areas represent sites important to the long-term viability and conservation of naturally occurring bird populations in North Carolina. IBAs represent a collection of sites that are assembled by a process of nomination and approval. Many of the areas appear to be of high spatial precision; however, some have inclusions of seemingly degraded habitat.</p> <p>Some IBAs are selected as the best examples for particular species or assemblages, and others are sites that are important but may be less unique. They represent important areas but may not be the best examples, represent an incomplete set of habitats, and may contain inclusions of poorer habitat.</p>
<p>Wetlands: National Wetlands Inventory (NWL)</p> <p><i>U.S. Fish & Wildlife Service</i></p>	<p>Terrestrial Biodiversity Sub-Model = 6</p>	<p>Wetlands across North Carolina were mapped by the National Wetland Inventory (NWI, 1983) of U.S. Fish and Wildlife Service. As a general class individual wetlands are not highly unique. Rare types and particularly high quality occurrences are covered by SNHAs and community EOs, so this data layer represents the remaining wetlands. However, in the parts of the state where wetlands are represented by NWI (in the Piedmont and Mountains), wetlands are rare and very important. NWI mapping represents only a moderate level of accuracy, and does not have a scale to determine condition or integrity</p> <p>Wetlands are areas of land where hydric conditions are a dominant environmental factor. The standard definition of wetlands that fall under federal jurisdiction as waters of the United States requires that soils be saturated with water for at least two weeks during the growing season, that soils show characteristics created by saturation, and that vegetation be composed predominantly of hydrophytes (plants adapted to growing in water or on a substrate that is deficient in oxygen due to excessive water content) (USACE 1987). Wetlands play particularly important roles in hydrologic cycling, water quality and nutrient cycling, as well as serving as important kinds of habitat and distinctive sites for many other ecosystem functions.</p>

<p>National Land Cover Dataset (NLCD, 2001)</p> <p><i>The Multi-Resolution Land Characteristics (MRLC) Consortium</i></p>	<p>Rankings of categories vary (see below)</p>	<p>The National Land Cover Dataset (NLCD) was developed by a group of federal partners improve the understanding of land use and land cover to be able to better evaluate changes in ecosystems and to develop baseline information needed to protect and mitigate future impacts to ecosystem health. The data set is derived from 2001 Landsat 5 Imagery (i.e., data that is developed by using satellite imagery) and includes per-pixel estimates of percent imperviousness and percent tree canopy and 36 total classes of land-cover data and derivatives of these classes using a decision tree. Our region has 14 of these classes present.</p> <p>A total of 9 categories of land use were used in the Agricultural Assessment, including:</p> <ul style="list-style-type: none"> • Developed, High Intensity • Developed, Medium Intensity • Developed, Low Intensity • Deciduous Forest • Evergreen Forest • Mixed Forest • Shrub/Scrub • Grassland/Herbaceous • Pasture/Hay • Cultivated Crops
<p>Cropland</p> <p>Referred to as “Agricultural” in the assessment</p> <p><i>(derived from NLCD, 2001)</i></p>	<p>Terrestrial Biodiversity Sub-Model = 4</p>	<p>Cropland represents 3 NLCD classifications:</p> <p><u>71. Grassland/Herbaceous</u> - Areas dominated by grammanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.</p> <p><u>81. Pasture/Hay</u> - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.</p> <p><u>82. Cultivated Crops</u> - Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.</p>
<p>Developed Open Space</p> <p><i>(derived from NLCD, 2001)</i></p>	<p>Terrestrial Biodiversity Sub-Model =2</p>	<p>Developed Land represents three NLCD classifications:</p> <p><u>21. Developed, Open Space</u> - Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-</p>

<p>Developed Open Space (continued) (derived from NLCD, 2001)</p>	<p>Terrestrial Biodiversity Sub-Model =2</p>	<p>family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.</p> <p><u>22. Developed, Low Intensity</u> - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-49 percent of total cover. These areas most commonly include single-family housing units.</p> <p><u>23. Developed, Medium Intensity</u> - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-79 percent of the total cover. These areas most commonly include single-family housing units.</p>
<p>Impervious Surfaces (derived from NLCD, 2001)</p>	<p>Terrestrial Biodiversity Sub-Model =1</p>	<p>Impervious surface represent NLCD classification:</p> <p><u>24: Developed, High Intensity</u> - Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. <i>Impervious surfaces account for 80 to 100 percent of the total cover.</i></p>
<p>Aquatic Significant Natural Heritage Areas (ASNHA) <i>NCDENR Natural Heritage Program</i></p>	<p>Aquatic Biodiversity sub-model: Federally & State Importance = 10 Regional Importance = 8</p>	<p>Aquatic SNHAs are conceptually similar to terrestrial SNHAs. They represent the waters that are of most importance to North Carolina's biodiversity. They are defined based on the actual presence of rare species.</p> <p>Because the protection of waters depends so strongly on the land adjacent to them, the area included for ASNHAs includes not only the water itself, but a buffer of 300 feet on each side of the streams and other water bodies. Buffers on streams within the watersheds of ASNHAs with federally listed species are given 200-foot stream buffers (per WRC 2002), and all other buffers on streams contributing to ASNHA watersheds are 100 feet; these stream buffers are given higher ratings because of the presence of rare species. Buffers are defined as a measurement from the toe of the slope on one side of the water body.</p> <p>Nationally significant ASNHAs represent the best in the nation, but not all of North Carolina's biodiversity is represented by them at even a minimal level. Since this assessment is intended to cover all of North Carolina's ecological needs, the best examples in the state also merit attention at the highest level. This is a small set, even within the ASNHAs. Regionally significant SNHAs are more numerous, but are still rare, limited in extent and among the best of their kind. They offer distribution of the elements throughout their ranges within the state, an important consideration for their long-term conservation.</p>

<p style="text-align: center;">Outstanding Resource Waters (ORW)</p> <p style="text-align: center;"><i>NC Division of Water Quality (DWQ)</i></p>	<p style="text-align: center;">Aquatic Biodiversity sub-model: 9</p>	<p>All outstanding resource waters are a subset of High Quality Waters. This supplemental classification is intended to protect and recognize unique and special waters having excellent water quality and being of exceptional state or national ecological or recreational significance.</p> <p>To qualify, waters must be rated Excellent by DWQ and have one of the following outstanding resource values:</p> <ul style="list-style-type: none"> • Outstanding fish habitat and fisheries, • Unusually high level of water-based recreation or potential for such kind of recreation, • Some special designation such as North Carolina Natural and Scenic River or National Wildlife Refuge, • Important component of state or national park or forest, or • Special ecological or scientific significance (rare or endangered species habitat, research or educational areas).
<p style="text-align: center;">Native Trout Streams</p> <p style="text-align: center;"><i>Wildlife Resources Commission</i></p>	<p style="text-align: center;">Aquatic Biodiversity sub-model: 9</p>	<p>These are waters that contain the naturally occurring and reproducing strains of Northern and Southern Appalachian Brook Trout. The stream reach where the native trout are known to occur, along with its 100-foot land buffer, is included in the model. Mapping and management of data related to Native Trout Waters is conducted by the Wildlife Resources Commission.</p> <p>The Southern Appalachian Brook Trout is the only native trout species in North Carolina, and they serve as indicators of the health of the watersheds they inhabit. Robust wild brook trout populations demonstrate that a stream or river ecosystem is healthy and that water quality is excellent. They indicate good examples of a particular kind of aquatic community. These waters represent a portion of the most significant aquatic communities in the state.</p>
<p style="text-align: center;">Stream Bioclass Benthos and Fish Community - Good and Excellent</p> <p style="text-align: center;"><i>NC Division of Water Quality (DWQ)</i></p>	<p style="text-align: center;">Aquatic Biodiversity sub-model: Excellent = 9 Good = 7</p>	<p>Benthos Data provide locality and collection information with latitude and longitude for benthic macro invertebrates (aquatic bugs). Stream-bottom macroinvertebrates are an important part of the community of life found in and around a stream and can be sensitive to water pollution. Thus, they can be important indicators about the quality of a stream over long periods of time.</p> <p>Fish Community data provide complete stream locality and collection information with latitude and longitude, fish species level identifications for all species, number of fish of each species collected following a standard sampling reach of 600 feet.</p> <p>Raw data is converted into North Carolina Index of Biotic Integrity scores and biological ratings (Excellent to Poor) for each sample.</p>

		Data covers the period from early to mid-1980s to present and consists of approximately 10,000 samples. Data helps indicate relative health of a water body.
<p>High Quality Waters (HQW) <i>NC Division of Water Quality (DWQ)</i></p>	<p>Aquatic Biodiversity sub-model: 8</p>	<p>High Quality Waters are a supplemental classification intended to protect and recognize waters that are rated excellent based on biological and physical/chemical characteristics through DWQ monitoring or special studies</p>
<p>Streams Buffers in Watersheds containing Federally Listed Threatened and Endangered Species <i>NC DENR Natural Heritage Program</i></p>	<p>Aquatic Biodiversity sub-model: 7</p>	<p>Stream buffers in watersheds containing federally listed species are rated based on their critical importance for rare species and high quality aquatic communities, in addition to their contribution to general water quality. Most of the water in the aquatic area of interest comes from the upstream tributaries, and is filtered through the stream buffers on them. While slightly less important than the immediately adjacent buffers, which also provide shading, bank stabilization, organic matter impact and other functions.</p>
<p>Priority Watersheds <i>NC Wildlife Resources Commission;</i> <i>The Nature Conservancy;</i> <i>or the DENR Natural Heritage Program</i></p>	<p>Aquatic Biodiversity sub-model: 6</p>	<p>Priority watersheds have been designated by several resource groups, including National Heritage Program (NHP), Wildlife Resources Commission (WRC), and The Nature Conservancy (TNC). NHP priority watersheds were designated based on all 14-digit HUCs that touch an Aquatic Significant Natural Heritage Area (see above). WRC priority watersheds were designated based on areas identified for habitat conservation and restoration. Criteria include areas with high species diversity, rare species and endemic species; specific areas that are critical to the survival of State Wildlife Action Plan priority species (e.g., particular streams or spawning sites); and areas recognized by previous national and/or regional prioritization efforts. TNC priority watersheds were designated based on occurrences of target species (i.e., imperiled, endemic, declining and wide-ranging species) and ecological systems that experts identified as conservation priorities. The priority areas were represented in three ways: 1) for creeks and small rivers, the entire watershed area was highlighted; 2) for medium and large rivers, stream lines</p>

		<p>were buffered by 1 kilometer; and 3) for spring complexes, important caves, and natural lakes with or without upstream or downstream tributary connections, polygons were delineated.</p> <p>Streams within these watersheds are given 100-foot or 200-foot buffers, with the larger buffers on streams in watersheds contributing to federally listed species habitat (WRC 2002). Protection of buffers on tributary streams in these watersheds is essential to protecting significant waters downstream.</p>
<p>303(d) Impaired Streams</p> <p><i>NC Division of Water Quality (DWQ)</i></p>	<p>Aquatic Biodiversity sub-model: 2</p>	<p>Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of waters not meeting water quality standards or which have impaired uses. Waters may be excluded from the list if existing control strategies for point and nonpoint source pollution will achieve the standards or uses. Listed waters must be prioritized, and a management strategy or total maximum daily load (TMDL) must subsequently be developed for all listed waters.</p>