Mean Total Harvestable Species Richness: Southeast

This EnviroAtlas national map displays the mean number of total harvestable species with potential habitat within each 12-digit hydrologic unit (HUC) in 9 southeastern states. These data are based on habitat models rather than wildlife counts. Potential habitat may be specific to wintering, breeding, or year-round activities depending on the species.

Why are harvestable species important?

The category total harvestable species encompasses big game, small game, waterfowl, and fur-bearer species. Harvestable species richness estimates the number of species inhabiting potential habitat that may be hunted or trapped. Harvestable species include elk, deer, grouse, rabbits, turkeys, ducks, and geese.

Each species plays an important role within its ecosystem. Harvestable species serve as both predators and prey in a food chain; a balance among primary and secondary consumers is an important element in maintaining self-sustaining ecosystems. Grazers and browsers, such as elk and white-tailed deer, directly modify the species composition and condition of grassland and forest habitats. Small game species disperse plant seeds, which can influence the distribution of (both native and non-native) plant species. Top predators, by regulating herbivore numbers, indirectly influence habitat condition by reducing grazing pressure on plant production. A predator-prey balance, now lost in many ecosystems in the Southeast, helps to maintain plant and animal species diversity.[1] In the absence of large predatory species, such as red wolves and cougar, the harvesting of large and small game by humans becomes a substitute for natural predator control.

In addition to their roles in ecosystems, harvestable species are appreciated for providing aesthetic value and recreational opportunities. The chance to see wildlife attracts visitors to parks and other wildlife management areas. Many of these species also serve as an important food source. The U.S. Fish and Wildlife Service estimated that hunters spent $33.7 billion in 2011, one-third of which went towards accommodations, transportation, and other tourism-related activities.[2]

The harvesting of these species provides an economic vehicle for conservation, management, and restoration projects, the benefits of which extend far beyond harvestable species. In 2013, the U.S. Fish and Wildlife Service


Photo: White-tailed Deer, USFWS

appropriated over $522 million for states to use for wildlife conservation and restoration purposes. This revenue comes from a federal excise tax placed on hunting equipment, and it is used to support conservation efforts, land acquisition, and wildlife restoration projects.

How can I use this information?

The map, Mean Total Harvestable Species Richness: Southeast, is one of three EnviroAtlas maps that illustrate indicators of harvestable species richness for the Southeast. Other EnviroAtlas maps show the maximum total harvestable species richness and a Normalized Index of Biodiversity (NIB) for each 12-digit HUC.[3,4] Used together or independently, these maps can help identify areas of potentially low or high species richness to help inform decisions about resource restoration, use, and conservation.

These maps can also be used in conjunction with other maps in EnviroAtlas such as protected areas (PADUS), connectivity, or GAP ecological systems to help identify areas with high ecological or recreational value for inclusion in conservation, recreation, or restoration planning. Connectivity planning and estimation of species' minimum area requirements are important considerations for mobile species with large territories.

After learning the harvestable species richness values for a particular 12-digit HUC, users can investigate an area more intensively by using higher resolution individual species models available through the Southeast Regional Gap Analysis Project (SEGAP).

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How were the data for this map created?

This data layer is based on data generated by the U.S. Geological Survey (USGS) National Gap Analysis Program (GAP). The GAP program maps the distribution of natural vegetation communities and potential habitat for individual terrestrial vertebrate species. These models utilize predictive environmental variables (e.g., GAP land cover, elevation, distance to water) to derive deductive habitat models for each species.

Southeast GAP modeled habitat for 78 harvestable species that reside, breed, or use the habitat within 9 southeastern states for a significant portion of their life history. Total harvestable species richness was calculated by combining predicted habitat for all GAP individual harvestable species by pixel across the 9 states. The total number of harvestable species in each pixel was summarized by 12-digit HUC and the mean value calculated for each HUC.

What are the limitations of these data?

EnviroAtlas uses the best data available, but there are still limitations associated with the data. These data, based on models and large national geospatial databases, are estimations of reality that may overestimate actual harvestable species presence. Modeled data are intended to complement rather than replace monitoring data. Habitat models do not predict the actual occurrence of species, but rather their potential occurrence based on their known associations with certain habitat types. Habitat is only one factor that determines the actual presence of a species. Other factors include habitat quality, predators, prey, competing species, and fine scale habitat features.

Other essential species information in addition to species richness includes the types of species and their functional groups, whether they are rare or common, native or non-native, tolerant or intolerant of disturbance. It is also important to consider that species numbers (at a landscape scale) tend to increase with moderate disturbance, meaning that moderately human-altered or disturbed habitats have higher numbers of species than either minimally disturbed or highly disturbed sites.[5]

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. Metric values for individual pixels may be obtained from the New Mexico State University Center for Applied Spatial Ecology. Individual species data may be obtained from the SEGAP geo-data server.

Where can I get more information?

A selection of resources related to harvestable species and biodiversity is listed below. Information on the models and data used in the USGS GAP and SEGAP projects is available on their respective websites. For additional information on how the data were created, access the metadata for the data layer from the drop down menu on the interactive map table of contents and click again on metadata at the bottom of the metadata summary page for more details. To ask specific questions about this data layer, please contact the EnviroAtlas Team.

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Selected Publications

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2. U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2013. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, FHW/11-NAT (RV), Washington, D.C.

3. Kepner, W.G., K.G. Boykin, D.F. Bradford, A.C. Neale, A.K. Leimer, and K.J. Gergely. 2011. Biodiversity Metrics Fact Sheet, EPA/600/F-11/006, U.S. Environmental Protection Agency, Washington, D.C.

4. Boykin, K.G., W.G. Kepner, D.F. Bradford, R.K. Guy, D.A. Kopp, A. Leimer, E. Samson, F. East, A. Neale, and K. Gergely. 2013. A national approach for mapping and quantifying habitat-based biodiversity metrics across multiple spatial scales. *Ecological Indicators* 33:139–147.

5. Marzluff, J.M. 2008. Island biogeography for an urbanizing world: How extinction and colonization may determine biological diversity in human-dominated landscapes. *Urban Ecosystems* 8:155–177.