Maximum Small Game Species Richness: Southeast

This EnviroAtlas national map displays the maximum number of small game 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 small game species important?

The term small game refers to smaller upland animals that are hunted. Their designation as a game species is determined by state fish and wildlife agencies. Small game species may include grouse, quail, pheasant, doves, squirrels, and rabbits. Small game species richness estimates the number of small game species that may inhabit an area based on potential habitat. Species richness is frequently used as a surrogate for measuring biodiversity and as a measure of the relative conservation value of a particular area. Many scientists believe that biodiversity, because it represents all forms of life on earth, provides or supports the core benefits that humans derive from their environment and helps sustain human culture worldwide. Many organizations consider managing areas for biodiversity as one way to achieve an acceptable balance among competing demands for various ecosystem services.[1]

Each species plays an important role within its ecosystem. Within a food chain, small game animals are primary consumers that serve as an important food source for other wildlife (secondary consumers). Small game species disperse plant seeds, which can influence the distribution of (both native and non-native) plant species. Seedling recruitment in grasslands occurs in areas of disturbance where openings are created in the turf. Grazing rabbits affect meadow grass and forb diversity through their varying grazing intensity and the numbers and species composition of seeds dispersed in disturbance patches.[2] Squirrels influence forest species diversity by broadcasting or burying seeds and nuts at feeding stations and buried caches.

Population declines have occurred in some historically abundant small game species because of habitat change and loss. Bobwhite quail depend on patches of early-successional vegetation, and their numbers have declined partly as a result of industrial farming and fire suppression. A similar decline in squirrel populations has occurred from widespread forest conversion to tree plantations and commercial development.


Photo: Eastern Fox Squirrel, Wikimedia Commons

In addition to their roles in ecosystems, game species are also an important food source. They are appreciated for the recreational opportunities they provide. Hunting for small game has a long tradition in the U.S. In 2011, hunters nationwide spent $2.6 billion on hunting small game species.[3] Revenue from federal excise taxes and state hunting licenses and permits contributes to the conservation of lands that support small game species.

How can I use this information?

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

After learning the small game 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 70 small game species that reside, breed, or use the habitat within the 9 southeastern states for a significant portion of their life history. Small game species richness was calculated by combining predicted habitat for all GAP individual small game species by pixel across the 9 states. The number of small game species in each pixel was summarized by 12-digit HUC and the maximum value noted for each HUC.

What are the limitations of these data?

EnviroAtlas uses the best data available, but there are still limitations associated with these data. These data, based on models and large national geospatial databases, are estimations of reality that may overestimate actual small game 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 game species and biodiversity is listed below. Information on small game species management can be found on each state's fish and wildlife department website. 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.

Acknowledgments

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Selected Publications

1. 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.

2. Edwards, G.R., and M.J. Crawley. 1999. Effects of disturbance and rabbit grazing on seedling recruitment of six mesic grassland species. *Seed Science Research* 9:145–156.

3. 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.

4. 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.

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.