Percent Small-Sized Patches of Natural Land Cover

This EnviroAtlas national map illustrates the percent of land within each 12-digit hydrologic unit (HUC) that is covered by small patches (<500 acres) of natural land cover. These data were generated by using a combination of the 2006 National Land Cover Database (NLCD) and the USDA's 2010 Crop Data Layer (CDL). Natural land cover includes forest, shrubland, grasslands, barren land, and wetlands. It excludes agriculture and developed land.

Why are patches of natural land cover important?

In 3 different national maps, EnviroAtlas provides an inventory of patches of natural cover summarized by HUC in 3 size classes: small patches <500 acres, medium patches 500–25,000 acres, and large patches > 25,000 acres. Natural land cover in a region provides a context for regional identity by indicating important aspects of climate, native ecosystem types, and associated habitats of an area of interest. For example, shrubland cover in the Great Basin is an expression of a semi-arid climate with about 13 inches/year of precipitation. Great Basin sagebrush habitats support an associated group of characteristic plant and animal species. However, the term *natural* in natural land cover does not imply anything about condition or lack of human disturbance but rather vegetative cover that may be managed for multiple purposes. For example, within EnviroAtlas, natural land cover refers to rangeland but not pasture, which is included under agriculture. Natural land cover also includes forest land that may be managed for recreation or for timber harvest.

The amount of natural land cover in a watershed affects both terrestrial and aquatic habitat quality. Patches of forest or native prairie may be all that remains of a once-continuous matrix of natural cover that has been fragmented by development. Natural land cover adjacent to streams and rivers (the riparian area) helps protect terrestrial wildlife habitat, aquatic habitat, and water quality especially in agricultural or urbanized areas where upland natural land cover may be degraded or lacking. Patches of natural land cover of varying sizes, both upland and riparian, provide ecosystem services in the form of temperature moderation, water purification, nutrient filtration, and flood storage.[1]

Remaining patches of natural land cover create critical habitat and corridors for wildlife and provide connectivity for organisms to move under cover among core areas of potential habitat or protective cover.[2] Landscapes with high connectivity allow species to move freely among core areas, whereas landscapes with low connectivity tend to isolate species within scattered patches.[2] Maintaining and creating connections among core areas with natural corridors is critical for retaining native biodiversity.


Photo: Small patch natural cover, Iowa, T. McCabe, NRCS

Ecosystem size and function decrease with continued loss of habitat through the fragmentation of natural patches. Exposure at the edges of smaller patches may mean increased pressure on both plants and animals from invasive species, parasitism, and predation. As patch sizes decrease, patches become more isolated and lose connectivity and important ecological functions, leading to species' population decline, lack of recruitment, and loss of genetic diversity.[3-5] These maps provide a resource for conservation and restoration by identifying natural land cover particularly in areas where it is in short supply.

How can I use this information?

This EnviroAtlas national map depicts the percentage of land covered by small patches of natural land cover less than 500 acres in size within each 12-digit HUC. One may click on individual HUCs in the interactive map to see the estimated percent of natural land cover. The maps may be overlaid and compared with other EnviroAtlas maps depicting land cover and habitat, ecoregions, agriculture, or streams and riparian zones to reveal how patches of natural land cover relate to landscape character and ecosystem services. Land cover, together with other EnviroAtlas data, can be used for conservation and to estimate risks from natural hazards.

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For example, the percent medium patch size of natural land cover maps may be compared with maps depicting protected status (PADUS, GAP, or IUCN) to assess the distribution of existing protected areas and the need for additional protection. The map may be used with EnviroAtlas connectivity maps to assess connectivity between patches. The presence of natural land cover is important for the maintenance of pollinators that are necessary for crop productivity (see the map layer and data fact sheet for the metric, Acres of Pollinated Crops with No nearby Pollinator Habitat).[6] Natural land cover may also be associated with major stressors such as national patterns of impervious area or nutrient sources such as manure or nitrogen fertilizer application. An area can be more thoroughly investigated by increasing the transparency of the map and adding data for streams and water bodies (NHDPlus) or National Wetland Inventory wetlands to the base map. Detailed examination of an aerial imagery base map can reveal where undeveloped land currently exists or where it may be at risk. For other related maps, see EnviroAtlas national and community data layers covering stream and lake buffers and connectivity.

How were these data created?

These data were generated by using a combination of the 2006 National Land Cover Database (NLCD) and the USDA's 2010 Crop Data Layer (CDL). The NLCD/CDL hybrid classes recognized as natural land cover were 63 Woodland, 83 Water, 87 Wetlands, 111 Open Water, 112 Perennial Ice/Snow, 131 Barren, 141 Deciduous, 142 Evergreen, 143 Mixed Forest, 151 Dwarf Shrub, 152 Shrubland, 171 Grassland/Herbaceous, 190 Woody Wetlands, and 195 Emergent Herbaceous Wetlands. HUC boundaries were taken from the National Hydrography Dataset Plus (NHDPlusV2) WBD Snapshot**.** The percentage of natural area per HUC is organized by size class: small patches <500 acres, medium 500–25,000 acres, and large > 25,000 acres. For more details on data creation, see the metadata**.**

What are the limitations of these data?

The landcover classes found in NLCD are created through the classification of 30 meter resolution satellite imagery. Human classification of landcover types that have a similar spectral signature can result in classification errors. As a result, both databases are a best estimate of actual landcover. The dates of the NLCD and the CDL reflect the dates of the satellite imagery used for the classification and therefore reflect conditions in 2006 and 2010, respectively. Periodic updates to EnviroAtlas will reflect improvements to nationally available data.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. NLCD, NHDPlusV2, and CDL data downloads are available at their respective websites.

Where can I get more information?

A selection of resources related to the importance of natural land cover patch size data is listed below. For additional information on how the data were created, access the metadata for the data layer. To ask specific questions about this data layer, please contact the EnviroAtlas Team.

Acknowledgments

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Selected Publications

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2. Bennett, A.F. 2003. Linkages in the landscape: The role of corridors and connectivity in wildlife conservation. International Union for Conservation of Nature, Gland, Switzerland and Cambridge, United Kingdom. 254 p.

3. Fischer, J., and D.B. Lindenmayer. 2007. Landscape modification and fragmentation: A synthesis. *Global Ecology and Biogeography* 16(3): 265–280.

4. Fahrig, L. 2003. Effects of habitat fragmentation on biodiversity. *Annual Review of Ecology, Evolution, and Systematics* 34:487–515.

5. Spielman, D., B.W. Brook, and R. Frankham. 2004. Most species are not driven to extinction before genetic factors impact them. *Proceedings of the National Academy of Sciences of the United States of America* 101(42): 15261–15264.

6. Gallant A.L., N.H. Euliss, Jr., and Z. Browning. 2014. Mapping large-area landscape suitability for honey bees to assess the influence of land-use change on sustainability of national pollination services. PLoS ONE 9(6): e99268.