Percent IUCN Status Ia

This EnviroAtlas national map displays the percentage of natural land within any given 12-digit hydrologic unit (HUC) that is classified as Category Ia for conservation purposes by the International Union for the Conservation of Nature (IUCN). The map is based on lands that have been compiled and classified by the USGS's Protected Areas Database of the U.S. (PAD-US).

Why is IUCN Status Ia land important?

Lands in Category Ia are nature reserves set aside for preservation with strict controls on human visitation, use, and impacts. Category 1a lands retain most expected native species and near-intact ecosystems. Lands considered protected by the IUCN have long-term protections in place to achieve the goals of conserving nature and associated ecosystem services and cultural values. They include lands held by national, state, or local governments or non-profit organizations, as well as voluntarily protected private land.

Undisturbed or minimally disturbed natural lands inherently serve numerous ecological, social, and cultural functions. These may include providing habitat, filtering and absorbing pollutants, maintaining ambient temperatures, providing visual relief from the built environment, and allowing for recreational activities. These functions have been associated with improving air quality, ensuring water quality protection, and removing pollutants from the air. Natural areas contribute to climate change mitigation by removing carbon dioxide from the atmosphere (during photosynthesis) and storing it as vegetative biomass (carbon sequestration).

These natural benefits can improve the mental and physical health of the surrounding population, as well. For example, visiting wilderness has been shown to provide psychological benefits, opportunities to bond socially, and a sense of connection to nature.[1] People can also recreate and exercise in natural areas, contributing to reductions in the prevalence of obesity, heart disease, and other physical illnesses.[1,2] Natural areas help ensure that drinking water is safe. Natural cover absorbs floodwaters and protects against natural disasters. For instance, protecting land from urban development and agriculture in drinking water watersheds can reduce pollutants and make water easier to treat.[3]

As the population grows, urban development is expected to increasingly replace natural lands. The United States is estimated to lose around 2 million acres of open space each

Photo: Frank Ceravalo/USFWS

year.[1] Giving land a protected status is one way to control where and how much land is developed.

How can I use this information?

The map, Percent IUCN Status Ia, is one of eleven EnviroAtlas maps that show protected lands for the United States. Other maps show the percentage of land with IUCN status in Categories Ia through VI, the percentage of land with any IUCN status, and percentages by 3 GAP Status categories under the U.S. Geological Survey's (USGS) National Gap Analysis Program (GAP).

Understanding the percentage of protected land area within a 12-digit HUC could help inform future planning and policy decisions, allow for comparisons within watersheds, river basins, or other regional boundaries, and allow users to quantify how much natural area has been set aside for future generations. Areas without significant protection could be vulnerable to future ecological degradation and may have existing ecological and health concerns.

This map could be used in conjunction with other maps in EnviroAtlas. For example, users can see how protected land area relates to air quality or water quality. Protected area land cover may be compared with other data layers depicting protected natural areas (PAD-US), protected status (GAP or IUCN Status maps), or occurrence of threatened and endangered species (see EnviroAtlas biodiversity data fact sheets) to assess whether there are adequate numbers of protected areas to represent important national ecosystems.

How were the data for this map created?

This dataset uses spatial information from the Watershed Boundary Dataset (WBD) and the PAD-US Version 1.2. The data for this map, with percentages of protected areas by category, were created using ATtILA (Analytical Tools Interface for Landscape Assessments). ATtILA is an Esri ArcView extension created by EPA that calculates many commonly-used landscape metrics. The percentage of each protection category was computed for each HUC. The protection categories used for this map were those defined by GAP or IUCN. Percentages were computed for IUCN Categories Ia, Ib, II, III, IV, V, and VI, as well as for all the IUCN categories combined. For more information on this calculation, see the ATtILA User's Manual.

What are the limitations of these data?

All national data layers are inherently imperfect; they are an estimation of the truth based on the best available science. Calculations based on these data are therefore also estimations that should be used to inform further investigation. Periodic updates to EnviroAtlas will reflect improvements to nationally available data.

The Percentage of Protected Lands uses PAD-US data (version 1.2), which is an aggregated dataset comprised of data provided by a number of sources. The boundaries of this data have not been verified by the EPA and there may be inconsistencies in data quality or scale. By using data with a margin of error, this computed metric may also carry that error in calculating the exact area of the protected land. The percentages in this layer should be used as a relative ranges and not to indicate an exact percentage value. More information regarding the limitations of the source data can be found at the PAD-US website.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded.

Where can I get more information?

There are many resources on the societal benefits associated with protecting lands; a selection of these resources is listed below. A detailed explanation of IUCN categories can be found on the IUCN website. 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

The data for this map were generated by Donald Ebert, EPA Landscape Ecology Branch. This fact sheet was created by Jessica Jahre and Megan Culler, EPA Student Services Contractors.

Selected Publications

1. Cordell, H.K., C.J. Betz, and S.J. Zarnoch. 2013. Recreation and protected land resources in the United States: A technical document supporting the Forest Service 2010 RPA Assessment. U.S. Department of Agriculture, Forest Service, Southern Research Station, Asheville, North Carolina.

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