The Intact Forest Landscapes 2000/2013

The IFL Mapping Team, September 2015

www.intactforests.org

Product description

An Intact Forest Landscape (IFL) is an unbroken expanse of natural ecosystems within the current forest extent, showing no signs of significant human activity, and large enough that all native biodiversity, including viable populations of wide-ranging species, could be maintained. For the purposes of our global assessment, an IFL is defined as a territory which contains forest and non-forest ecosystems minimally influenced by human activity, with (i) an area of at least 500 km^2 (50,000 ha), (ii) a minimum width of 10 km (measured as the diameter of a circle that could be entirely inscribed within the boundaries of the territory), and (iii) a minimum corridor/appendage width of 2 km. Areas with the evidence of certain types of human influence are considered disturbed or fragmented and consequently not eligible for inclusion in the IFL. Specifically, we excluded from the IFL areas which in the last 30-70 years were affected by industrial activities (e.g. logging, mining, oil and gas exploration and extraction) or by stand-replacement fires in the vicinity of transport infrastructure or resource extraction sites, or which were cleared for agriculture or transformed into tree plantations. Settlements and infrastructure (including roads, navigable rivers, power lines, and pipelines) are excluded with a buffer zone of 1 km. Low-intensity and old (> 70 years) disturbances are treated as a "background" influence, and don't lead to exclusion of the area from the IFL. Sources of background influence include historic (abandoned) shifting cultivation activities, diffuse grazing by domestic animals, low-intensity selective logging, and hunting. Although all IFLs are located within the forest zone (area with tree canopy over above 20%), some may contain extensive naturally tree-less areas, including grasslands, wetlands, lakes, alpine areas, and ice, if they are surrounded by forests.

IFL mapping and monitoring relies on freely available medium spatial resolution satellite imagery (primarily Landsat), high spatial resolution imagery available through Google Earth (TM) platform, and road and settlement data from open access sources. The IFL concept and mapping method were developed by a group of non-governmental environmental organizations (Greenpeace, World Resources Institute, and Transparent World) and have been used both in regional and global forest monitoring and research projects. For detailed methodology overview please refer to *Potapov et al., 2008* and the IFL project website www.intactforests.org

The IFL concept and its technical definition were introduced to help create, implement, and monitor policies concerning forest degradation at the regional-to-global levels. The essence of the IFL method is to establish the boundaries of large undeveloped forested areas and to use these boundaries as a baseline for forest degradation monitoring. The significance of the IFL mapping lies in its power to enable and catalyze practical conservation planning and action with regard to large undeveloped forest

landscapes. Protection of large natural forest landscapes is of high priority within a framework of international strategic initiatives on forest biodiversity (Convention on Biological Diversity) and reduction of carbon emissions from deforestation and forest degradation (International Geosphere‑Biosphere Program, Reducing Emissions from Deforestation and Forest Degradation). The IFL method could be used for fast and cost-effective assessment and monitoring of forest degradation in the context of REDD+ mechanism and for sustainable forestry certification process (e.g. Forest Stewardship Council certification).

Product history

The first global IFL map (IFL 2000 v1.0) was prepared in 2005-2006 under the leadership of Greenpeace, with contributions from Biodiversity Conservation Center, International Socio-Ecological Union, and Transparent World (Russia), Luonto Liitto (Finnish Nature League), Forest Watch Indonesia, and Global Forest Watch, a network initiated by the World Resources Institute. The map was updated to v.2.0 by Greenpeace Russia and the University of Maryland in 2012 using the year 2000 global cloud-free Landsat data composites that were produced following the methodology developed by *Hansen et al. (2013)*. The outdated v1.0 and v2.0 datasets are available on the project website.

The global IFL map update was performed in 2014-2015 by Greenpeace, The University of Maryland and Transparent World, with support from the World Resources Institute and WWF Russia. The new analysis shows the extent of the IFL by the end of the year 2013, and their degradation since the year 2000. The year 2000 dataset was corrected in a few instances. Specifically, IFL boundaries were corrected if the available high-resolution satellite data from Google Earth (TM) revealed pre-2000 infrastructure or disturbances that were not clearly visible on year 2000 Landsat data. The boundaries of the forest zone (area with 20% tree canopy density) were corrected using the year 2000 Landsat-based tree canopy cover dataset *(Hansen et al., 2013)*, and a few IFL areas were excluded as located outside of the forest zone. The IFL map update for the year 2013 was based on the same data sources and methodology as the year 2000 mapping to ensure consistency. In our work we leveraged annual cloud-free Landsat composites and the 2001-2013 gross tree cover loss map produced by the University of Maryland and distributed on-line for free (http://earthenginepartners.appspot.com/science-2013-global-forest). During the IFL update, all human-induced forest clearing, new infrastructure, and burned areas adjacent to actively used infrastructure (permanent roads, rivers, pipelines and power lines) were excluded from the year 2000 IFL, and the remaining areas were attributed as the year 2013 IFL if they passed our size and shape criteria. The 13-year monitoring results revealed the alarming speed at which the world's intact forests are being degraded. These results confirm our findings from earlier regional studies in the Democratic Republic of the Congo and Indonesia (*Zhuravleva et al., 2013*; *Margono et al., 2014*).

Product availability and licensing

All up-to-date IFL maps and IFL monitoring results are available from the project website **www.intactforests.org** in formats suitable for use in professional GIS and freeware GIS browsers. The IFL Mapping Team is continuing to improve the IFL base map and to provide periodical updates as new data, technologies, and more sophisticated sources of information become available. Please check News & Updates for the information about the latest map releases.

We suggest referencing the IFL maps as:

Potapov, P., A. Yaroshenko, S. Turubanova, M. Dubinin, L. Laestadius, C. Thies, D. Aksenov, A. Egorov, Y. Yesipova, I. Glushkov, M. Karpachevski, A. Kostickova, A. Manisha, E. Tsybikova, and I. Zhuravleva. 2008. "Mapping the World's Intact Forest Landscapes by Remote Sensing." Ecology and Society 13, no. 2: Art. 51. www.ecologyandsociety.org/vol13/iss2/art51.

For the web-based applications the suggested reference is:

Greenpeace, University of Maryland, World Resources Institute and Transparent World. "Intact Forest Landscapes 2000/2013."Available at www.intactforests.org

Technical description

The global IFL data provided in the ArcGIS shapefile format in geographic coordinates using the WGS84 coordinate system. The recommended scale for data visualization is 1:1,000,000. The dataset includes two layers: the IFL extent for the years 2000 and 2013. The year 2000 dataset contains the unique IFL patch ID combined from the IFL region code (see below) and unique ID within the region, e.g. “AFR_25”. The same ID was retained for the year 2013 dataset, however, in case IFL patch was fragmented into separate patches, an additional unique index was added to the IFL ID, e.g. “AFR_25_1”, “AFR_25_2”, etc. The area of IFL patches is provided in thousands of hectares. Due to the limitations and possible uncertainties in exact area estimation, the actual area threshold for the IFL patch inclusion was 49,000 (instead of 50,000) hectares.

An equal-area map projection was used to calculate the IFL patch size and to define buffer areas around infrastructure. A separate equal-area projection was used in each geographic region for mapping and data analysis. These regions, abbreviations, and projections used for area calculation are presented below:

Africa (AFR)	Sinusoidal; WGS84; Central Meridian (CM) 20°E
Australia and New Zealand (AUS)	Albers Conical Equal-Area; WGS84; CM 140°E; RL 0°N; ST1 10°S; ST2 45°S
North America (NAM)	Albers Conical Equal-Area; WGS84; CM 96°W; RL 00°N; ST1 20°N; ST2 60°N
Northern Eurasia (NEA)	Albers Conical Equal-Area; WGS84; CM 80°E; RL 0°N; ST1 50°N; ST2 70°N
South America (SAM)	Sinusoidal; WGS84; CM 60°W
South-East Asia (SEA)	Sinusoidal; WGS84; CM 140°E