

ACRONYMS AND ABBREVIATIONS

AIIB	Asian Infrastructure Investment Bank
A.P.E.S.	Ape Populations, Environments and Surveys
AWA	Animal Welfare Act
AWF	African Wildlife Foundation
AZA	Association of Zoos and Aquariums
B–K	Blangkejeren–Kutacane
BAP	biodiversity action plan
BEGES	Bureau d'Études Spécialisé en Gestion Environnementale et Sociale, DRC
BOSF	Borneo Orangutan Survival Foundation
BP	bank procedures
BUPAC	Bili–Uélé Protected Area Complex
CAP	conservation action plan
CAR	Central African Republic
CBG	Compagnie des Bauxites de Guinée
CI	Cellule Infrastructures
CIA	cumulative impact assessment
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
cm	centimeter
DDNP	Deng Deng National Park
DFID	United Kingdom Department for International Development
DNA	deoxyribonucleic acid
DOPA	Digital Observatory for Protected Areas
DRC	Democratic Republic of Congo
DSEZ	Dawei Special Economic Zone
EAZA	European Association of Zoos and Aquaria
EIA	environmental impact assessment
ESAP	environmental and social advisory panel
ESIA	environmental and social impact assessment
FCFA	Franc Communauté Financière Africaine (Central African franc)
FFI	Fauna and Flora International
FOIA	Freedom of Information Act
FPIC	free, prior and informed consent
FPP	Forest Peoples Programme
FSC	Forestry Stewardship Council
GAC	Guinea Alumina Corporation
GEI	Global Environmental Institute
GFAS	Global Federation of Animal Sanctuaries
GFW	Global Forest Watch

GLAD	Global Land Analysis and Discovery
GLNP	Gunung Leuser National Park
GP	good practice
GRanD Database	Global Reservoir and Dam Database
gROADS	Global Roads Open Access Data Set
GW	gigawatt
I–R–K	Ilagala–Rukoma–Kashagulu
IAR	International Animal Rescue
ICCN	Institut Congolais pour la Conservation de la Nature
IFC	International Finance Corporation
IGCP	International Gorilla Conservation Programme
IHA	International Hydropower Association
IIED	International Institute for Environment and Development
IUCN	International Union for Conservation of Nature
ha	hectare
HKU	University of Hong Kong
HSUS	Humane Society of the United States
km	kilometer
km²	square kilometer
kV	kilovolt
ILO	International Labour Organization
JRC	European Commission Joint Research Centre
KBNP	Kahuzi-Biega National Park
kg	kilogram
KNU	Karen National Union
Lao PDR	Lao People's Democratic Republic
LAPSSSET	Lamu Port, South Sudan, Ethiopia Transport (corridor)
LPHP	Lom Pangar Hydropower Project
LRA	Lord's Resistance Army
m	meter
MAAP	Monitoring of the Andean Amazon Project
MDB	multilateral development bank
MMNP	Mahale Mountains National Park
MW	megawatt
MYR	Malaysian ringgit
NCR	native customary rights
NGO	non-governmental organization
OP	operational policy
OSM	OpenStreetMap
OVAG	Orangutan Veterinary Advisory Group
PA	protected area
PAD	project appraisal document
PADDD	protected area downgrading, downsizing and degazettement

PASA	Pan African Sanctuary Alliance
Pro-Routes	High-Priority Roads Reopening and Maintenance
RAEL	Renewable and Appropriate Energy Laboratory
REDD	Reducing Emissions from Deforestation and Forest Degradation
RRI	Rights and Resources Initiative
RSPO	Roundtable on Sustainable Palm Oil
Save Rivers	Save Sarawak Rivers Network
SCORE	Sarawak Corridor of Renewable Energy
SEB	Sarawak Energy Berhad
sp.	species (singular)
spp.	species (plural)
SSP	Species Survival Plan
TANROADS	Tanzania National Roads Agency
TBC	The Biodiversity Consultancy
TCL	tiger conservation landscape
TH-L	Tamang Hulu-Lokop
THV	terrestrial herbaceous vegetation
TNC	The Nature Conservancy
TRIDOM	Tri-National Dja-Odzala-Minkébé
UGM	Universitas Gadjah Mada (university)
UNEP	United Nations Environment Programme
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
UNESCO	United Nations Education, Science and Culture Organization
WARN	Wild Animal Rescue Network
WB	World Bank
WCS	Wildlife Conservation Society
WISER	World Indigenous Summit on Environment and Rivers
WWF	World Wide Fund for Nature/World Wildlife Fund

GLOSSARY

Algorithm: A set of instructions or rules for performing tasks such as calculations, data processing and automated reasoning.

Alternative energy: Usable power derived from sources other than fossil fuels, often with a focus on avoiding pollution and greenhouse gas emissions. See also: **clean energy** and **renewable energy**.

Anthropocene: A buzzword used to refer to the current geological epoch in view of humankind's profound impact on Earth. The term was popularized by atmospheric chemist Paul Crutzen in 2000 and recommended for adoption by a dedicated working group of the International Union of Geological Sciences in 2016. Scholars disagree about the start date of the Anthropocene, with suggestions ranging from 8,000 years ago to about 1950.

ArcGIS Desktop: A mapping and spatial data analysis application produced by Esri.

ArcGIS Online: An Internet-based mapping platform developed by Esri that enables users to access, create and share maps, scenes, apps, layers, analytics and spatial data. Available at: www.esri.com/software/arcgis/arcgisonline.

Artificial Intelligence for Ecosystem Services (ARIES): A suite of computer models that support science-based decision-making to promote environmental sustainability. Available at: aries.integratedmodelling.org.

Association of Southeast Asian Nations (ASEAN) Heritage Parks: Sites throughout the ASEAN region—Brunei, Cambodia, Indonesia, Laos PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam—that are designated conservation areas in recognition of their rich biodiversity; four of the 37 sites are also UNESCO World Heritage sites.

Base-load demand: The power required to run facilities, electronics and appliances that are always on, such as hospitals and refrigerators, in contrast to peak-load demand, which is the power needed to run appliances and machines that can be turned on and off, such as computers and televisions.

Behavioral enrichment: Conditions or stimuli introduced to establish and support species-specific natural behaviors and reduce aberrant ones, with the goal of improving the psychological and physiological well-being of captive animals.

Bimaturism: Development characterized by differing stages or timings within a species or within a sex; among orangutans, mature males are flanged or unflanged (see **flanged**).

Bing Maps: An online mapping service that is part of Microsoft's Bing suite of search engines and that offers worldwide orthographic aerial and satellite imagery. Available at: www.bing.com/maps.

Biodiversity: The variety of plant and animal life on earth or in a particular habitat.

Biodiversity hotspot: A significant reservoir of biodiversity that is threatened with destruction.

Biota: Plant and animal life of a specific region.

Blood diamond: A diamond mined in a war zone and sold to finance an insurgency, an invading army's war efforts or a warlord's activity.

Blood gold: Gold mined by enslaved or otherwise victimized populations, including brutalized Congolese and the impoverished illegal miners of South Africa.

Boom-and-bust cycle: Alternating periods of economic growth and contraction. An increase in business activity, for example in connection with exploitation of a valuable natural resource, may be followed by sharp price declines for the resource or its overexploitation, a spike in unemployment and a drop in returns to investors.

Brachiation: Arboreal locomotion that relies exclusively on the arms to propel the body forward. Related term: brachiate.

Catchment: A rural or urban area where the natural landscape collects water from rain, or other precipitation. This gradually drains into a common outlet, such as a river, a bay or another body of water. Also referred to as a drainage area, river basin or watershed.

Circular economy: An economic model that aims to transform waste into resources and to bridge gaps between production and consumption.

Clean energy: Usable power generated with little or no pollution or greenhouse gas emissions, as derived from renewable sources such as sunlight, wind, biomass and waves, in contrast to “dirty” sources of energy, such as fossil fuels (coal, natural gas and oil). Not all geothermal and hydroelectric power is clean energy. See also: **alternative energy** and **renewable energy**.

Cleaner production: Processes and services that are characterized by the continual application of strategies that increase efficiency and reduce risks to the environment.

Cloud computing (or cloud technology): The use of a network of remote servers hosted on the Internet to store, manage and process data.

Conspecific: A member of the same species.

Core area: The most heavily used portion of the home range of a group or individual.

Corridor: See **Wildlife Corridor**.

Cost–benefit analysis: A process by which the benefits of a given situation or action are summed and the corresponding costs are subtracted; opportunity costs may also be factored in.

Cost engineering: The practice of managing project costs by using approaches such as estimating, cost control, cost forecasting, investment appraisal and risk analysis.

Critical habitat: An area of high biodiversity value. The International Finance Corporation defines it as habitat of significant importance to critically endangered, endangered, endemic, or restricted-range species; habitat that supports globally significant concentrations of migratory or congregatory species; a highly threatened or unique ecosystem; or an area associated with critical evolutionary processes (IFC, 2012a, p. 4).

Critically endangered: Facing an extremely high risk of extinction in the wild.

Cumulative impact: The incremental effects of one project, combined with the past, present and foreseeable future effects arising from other developments (such as infrastructure, extractive or agricultural activities) in selected areas.

Cumulative impact assessment (CIA): An evaluation that factors in the combined effects of past, present and foreseeable human activities, over time and on the environment, economy and society in a particular place.

Customary title to land: Recognition of a community’s rights to access, use and control an area of land, usually based on long-established, traditional patterns or norms. Customary forest and community territory fall within this category. Customary or international law may be the source of such titles, particularly if relevant rights are not enshrined in a country’s statutory legislation.

Deciduous: Pertaining to trees that lose their leaves for part of the year.

Decommissioning: In relation to dams, full decommissioning is the full removal of a dam; partial decommissioning is the partial removal of a dam.

Delegated management contractor: A public or private entity that is hired to implement a specified aspect of a development project on behalf of a state or other stakeholder.

Deterrent: A punishment or other measure established to discourage future attempts at breaking the law.

Developer: In the context of infrastructure, a firm that undertakes any of a variety of tasks related to developing a project, such as planning, finance, engineering, construction, hiring and management of assessors, compliance with regulations and coordination with partners.

Development corridor: An area characterized by major integrated infrastructure, such as paved roads, railroads, power lines and gas lines that run in parallel and are designed to open up regions for increased economic activity and land use, such as in Africa and other parts of the developing world.

Dichromatic: Exhibiting two color variations independent of sex and age.

DigitalGlobe: A commercial vendor of high-resolution satellite imagery and geospatial content. Available at: www.digitalglobe.com.

Digital Observatory for Protected Areas (DOPA): A global database of protected areas and their characteristics, operated by the European Commission’s Joint Research Centre. Available at: dopa.jrc.ec.europa.eu.

Dimorphic: Having two distinct forms.

Dipterocarp: A tall hardwood tree of the family Dipterocarpaceae that grows primarily in Asian rainforests and that is the source of valuable timber, aromatic oils and resins.

Dispatchable renewables: Renewable electricity whose output can be adjusted to meet demand.

Dispersing sex: Either male or female apes who, upon reaching sexual maturity, depart from their birth area to establish their own range.

Diurnal: Daily, or active during the day.

Downstream: Towards the mouth of a river.

Ecosystem representativeness: The degree to which an ecosystem unit is representative of a biological or physical class to which it belongs, typically in accordance with biological and physical criteria. A patch of old-growth rainforest in a protected area may have a high or low representative value with respect to the vegetation type in the surrounding landscape.

Endangered: Facing a very high risk of extinction in the wild.

Endemic: Native to or only found in a certain place; indigenous.

Endemism: The state of being unique to a particular geographic area.

Environmental (and social) impact assessment (EIA or ESIA): An analytical tool used to identify and assess potential environmental (and social) impacts of a project, development or policy. The parameters for drawing up an EIA (or ESIA) are typically laid out in an environmental (and social) management framework. ESIA's are sometimes referred to as social and environmental impact assessments (SEIAs).

Environmental (and social) management framework: A plan that specifies what procedures to use in the preparation and approval of a site-specific environmental (and social) impact assessment or environmental (and social) management plan for a development project.

Environmental (and social) management plan: Guidance that identifies a set of mitigation, management, monitoring and institutional measures and explains how to apply them during the implementation and operation phases of a development project. Drawn up in accordance with an environmental (and social) management framework, the plan is designed to eliminate, offset and reduce adverse environmental (and social) impacts identified in an environmental (and social) impact assessment.

Environmental protection function: The ability of a forest or other ecosystem to contribute to the conservation of a landscape, habitat, soil or hydrogeological area, or to the preservation of human settlements or other assets, by preventing or reducing the impact of destructive natural events.

Externality: A positive or negative consequence of an economic activity as experienced by a party that is not directly related to the production or consumption.

Fission–fusion: Pertaining to communities whose size and composition are dynamic due to the coming together (fusion) and moving away (fission) of individuals.

Flanged: Pertaining to one of two morphs of adult male orangutan, the other being “unflanged”; characterized by large cheek pads, greater size, a long coat of dark hair on the back and a throat sac used for “long calls.”

Floodplain: Relatively flat land that stretches out from either side of a river and that may flood during heavy rain or snowmelt. Since floodplain soil integrates materials deposited by a river, it is typically rich in nutrients and ideal for cultivation.

Folivore: Any chiefly leaf-eating animal. Related terms: folivorous, folivory.

Forest-smart approach: A strategy that aims to maximize the benefits from development investments while minimizing the negative impacts to forests and forest biodiversity.

Free, prior and informed consent (FPIC): The principle that a community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use. It is a normative obligation whereby a state must seek the voluntary consent of indigenous peoples (including indigenous forest-dependent communities) as a precondition to allowing or engaging in activities that could significantly affect the communities' substantive rights, such as the right to property. While there is no internationally agreed definition of FPIC or any single mechanism for its implementation, international human rights instruments and other treaty obligations grant potentially impacted peoples the right to give or withhold their consent to proposed actions.

Frugivore: Any chiefly fruit-eating animal. Related terms: frugivorous, frugivory.

Functional connectivity: The degree to which the land that divides and separates natural habitats facilitates or impedes the habitats' ability to allow movements of animals and to perform ecosystem functions. See also: **structural connectivity**.

G20: An international forum for the leaders, finance ministers and central bank governors of 20 major economies. Its members are the eight leading industrialized nations—in descending order, the United States, Japan, Germany, the United Kingdom, France, Italy, Canada and Russia; 11 emerging-market and smaller industrialized countries, namely Argentina, Australia, Brazil, China, India, Indonesia, Mexico, Saudi Arabia, South Africa, South Korea and Turkey; and the European Union.

Gallery forest: A narrow stretch of forest along the banks of a body of water, such as a river or wetland, that projects into non-forested landscapes. See also: **riparian forest**.

Geobrowser: A geographical web browser designed to access satellite and aerial imagery, ocean bathymetry and other geographic data over the Internet to represent Earth as a three-dimensional globe.

Geographic information system (GIS): A tool that allows users to capture, store, manipulate, analyze, manage and present spatial and geographic data.

Georeferencing: The process of aligning geographic data to a known coordinate system so it can be viewed and analyzed with other geographic data.

Gigawatt: A unit of power equal to one billion watts.

GLAD (Global Land Analysis & Discovery): A laboratory in the Department of Geographical Sciences at the University of Maryland that investigates methods, causes and impacts of global land surface change. GLAD's primary data source is Earth-observation imagery; its key focus area is land cover extent. Available at: glad.geog.umd.edu.

Global Accessibility Map: A mapping tool designed to estimate the travel time from any point on Earth to the nearest city exceeding 50,000 people. Developed by the European Commission's Joint Research Centre and first published by the World Bank in 2008, it can serve as a proxy for rural populations' access to **services and resources** in urban areas. Available at: forobs.jrc.ec.europa.eu/products/gam. See also: **Roadless Forest**.

Global Forest Watch (GFW): An open-access initiative of the World Resources Institute that provides a range of remote-sensing and other databases designed to monitor forests globally. Available at: www.globalforestwatch.org.

Global Positioning System (GPS): A US-owned tool that allows users access to positioning, navigation and timing services. The US Air Force maintains and develops the utility.

Global Roadfree Areas Map: Launched in 2012 under the aegis of the **RoadFree** initiative, this collaboration between Google, the Society for Conservation Biology and the European Parliament assesses the status, quality and extent of all protected areas. Available at: roadfree.org.

Global Roadmap: An initiative run by an alliance of environmental scientists, geographers, planners and agricultural specialists whose aim is to enhance planning for roads in ways that reduce the environmental impacts of roads, limit construction of new roads and road improvements to where they will have the greatest social and economic benefits, assist environmental managers to better plan and prioritize roads, and educate the general public about the environmental risks of poorly planned roads and transportation projects. Available at: www.global-roadmap.org.

Global Roads Open Access Data Set (gROADS): A freely available data set on roads. Horizontal-accuracy limitations (± 2 km) restrict its use to general comparisons. Available at: sedac.ciesin.columbia.edu/data/set/groads-global-roads-open-access-v1.

GLOBIO tool: Designed to facilitate environmental assessments and provide policy support, this global biodiversity model serves to evaluate past, present and future impacts of human activity on biodiversity. Available at: www.globio.info.

Google Earth: A geobrowser released by Google in 2005. Available at: www.google.com/earth/index.html.

Google Earth Engine: A cloud computing platform that processes satellite imagery and other Earth-observation data and analyzes geospatial information. It provides access to a large catalog of satellite imagery and the computational power needed to analyze those images. Available at: earthengine.google.com.

Google Maps: Launched in 2005, this online mapping service offers satellite imagery, street maps, panoramic views of streets, information on traffic conditions and route planning. Data for rural areas are patchier than for urban centers. Available at: maps.google.com.

Green procurement: The acquisition of products and services that cause minimal adverse environmental impacts. The approach incorporates human health and environmental concerns into the search for high-quality products and services at competitive prices.

Ground truth: Empirical evidence collected on location, as opposed to information inferred from other sources, such as satellite imagery.

Habitat: The natural and required environment of an animal, plant or other organism

Herbivore: Any plant-eating animal. Related terms: herbivorous, herbivory.

Home range: An area that is used by an individual or group on a regular basis and, in territorial species, is defended from others. Not to be confused with **ape range**, which is the extent of occurrence (EOO) of each species, as explained in the Notes to Readers, p. ix.

Hybrid: The offspring of two different species or varieties of plant or animal; something that is formed by combining different elements.

Hydrological connectivity: The degree to which water, and the organisms, matter and energy within it, is able to freely move with natural timing through the hydrologic cycle, including along and between longitudinal (river length), lateral (floodplain) and vertical (groundwater) dimensions.

Impounding reservoir: An artificial lake formed by constructing a dam across a natural watercourse so that water builds up behind it.

Impoundment: The accumulation of water in a reservoir or other storage area.

Indigenous: Originating from or occurring naturally in a certain place.

Induced access: Project-related encroachment into a landscape.

Infanticide: The act of killing an infant.

Integrated Biodiversity Assessment Tool (IBAT) for Business: A database for accessing biodiversity information, including Key Biodiversity Areas and legally protected areas. Via an interactive mapping tool, decision-makers can identify biodiversity risks and opportunities within a project's boundary. Available at: www.ibatforbusiness.org.

Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST): A suite of open source software models used to map and value goods and services from nature. Available at: www.naturalcapitalproject.org/invest.

Interbirth interval: The biologically determined period of time between consecutive births.

Karst: A landscape formed through the dissolution of soluble rocks, such as limestone, dolomite and gypsum, and characterized by underground drainage systems with sinkholes, dolines and caves.

Keystone species: A species that plays a crucial role in the way an ecosystem functions, and whose presence and role has a disproportionately large effect on other organisms within the ecosystem.

Landsat imagery: Medium-resolution (30 m × 30 m) satellite images acquired by any of the six satellites in the **Landsat program**. Landsat images can be viewed and downloaded for free from the United States Geological Survey Earth Explorer website. Available at: earthexplorer.usgs.gov.

Landsat program: The longest-running endeavor to capture satellite imagery of Earth. Since the program's launch in 1972, its satellites have acquired millions of images. See also: **Landsat imagery** and **Landsat Thematic Mapper**.

Landsat Thematic Mapper (TM): A Earth-observing sensor placed aboard a satellite in the **Landsat program**. A TM features seven bands of image data (in visible and infrared wavelengths), most of which have a resolution of 30 m. An Enhanced Thematic Mapper Plus (ETM+) sensor, which includes an eighth (panchromatic) band with a spatial resolution of 15 m, was onboard Landsat 7 when it successfully launched in 1999. See also: **Landsat imagery**.

Landscape metrics: Measurements of one or more sections of an area of land, such as patches of forest or mosaics, used to quantify composition and spatial configuration, including forest size and fragmentation.

Logging Roads: By combining **OpenStreetMap** and satellite imagery, this initiative maps and dates logging roads, particularly in the Congo Basin. Available at: loggingroads.org.

Mast fruiting: The simultaneous production of fruit by a large numbers of trees every 2–10 years, without any seasonal change in temperature or rainfall.

Megawatt: A unit of power equal to one million watts.

Metapopulation: A group of spatially separated populations of the same species that interact at some level.

Miombo: An oak-like tree (genus *Brachystegia*); a type of savannah woodland found across eastern and southern Africa dominated by these trees.

Mitigation: The act of making a condition or consequence less severe.

Mitigation hierarchy: A tool used to limit the negative impacts of development projects on biodiversity.

Monodominant forest: A forest in which more than 60% of the tree canopy consists of a single species of tree.

Monogamy: The practice of having a single mate over a period of time.

Morph: A distinct form of an organism or species.

My DigitalGlobe: A web-based application through which users can view, analyze and download DigitalGlobe's high-resolution satellite images. Available at: services.digitalglobe.com/myDigitalGlobe.

National strategic areas: In line with Indonesia's 2007 law on spatial planning, domestic conservation areas recognized for their rich biodiversity. In an effort to protect the ecosystems and curb rent-seeking among officials, the law stipulates that individuals who engage in or facilitate illegal activities in such areas may be charged with criminal offences.

Natural resource management: The application of scientific and technical principles to control environmental assets such as land, water, soil, plants and animals so as to meet ecological, economic, social and policy objectives.

Net gain: In an ecological context, a positive outcome for biodiversity following a development project and the application of targeted conservation measures.

No deforestation: A corporate policy aimed at protecting forest and peatland while minimizing the impact of operations on biodiversity and local communities. Implementation of the policy requires assessments to be conducted for high conservation value forest areas prior to the clearing of any land. Related term: zero deforestation.

No net loss: In an ecological context, an outcome that avoids an overall loss of biodiversity and ecosystem services following a development project and targeted conservation activities. This term is often used in association with the **mitigation hierarchy**.

Offset: Compensation for loss of biodiversity due to a development project.

Open Standards for the Practice of Conservation: An adaptive planning framework utilized by governments and non-governmental organizations around the world to conserve flora and fauna collaboratively and systematically. Available at: cmp-openstandards.org.

OpenStreetMap (OSM): Launched in 2004, this free and editable map of the world is continually updated by registered members. OSM data feeds into the **Roadless Forest** and **Logging Roads** mapping initiatives, among other programs focused on environmental crises. Available at: www.openstreetmap.org.

OpenStreetMap (OSM) Analytics: Released in 2016, this platform enables the tracking of mapping activity for roads and buildings at the global level. Available at: osm-analytics.org.

Optimism bias: A systematic tendency to underestimate the probability of negative events.

Outstanding Universal Value: A UNESCO designation used to recognize heritage of exceptional cultural or natural significance and signal that its permanent protection is of the highest importance to the international community.

Pathogen: A virus, bacteria or other microorganism that can cause disease.

Pathogenic: Capable of causing disease.

Pelage: Fur; coat.

Pith: The spongy tissue in the stems and branches of many plants.

Pixel: The smallest unit of information in an image; the fundamental unit of data collection in remote sensing.

Planet: A commercial vendor of high-resolution satellite imagery and geospatial content. Available at: www.planet.com.

Pollution haven: A jurisdiction that attracts polluting industries due to limited environmental restrictions, as posited by the pollution haven hypothesis (or pollution haven effect).

Polyandrous: Pertaining to a mating system that involves one female and two or more males.

Polygynandrous: Pertaining to an exclusive mating system that involves two or more males and two or more females. The numbers of males and females are not necessarily equal.

Polygynous: Pertaining to a mating system that involves one male and two or more females.

Preputial: Relating to the foreskin or clitoral hood.

Project appraisal document (PAD): A comprehensive, continually updated record of a development project, covering aspects such as the development problem to be addressed, the technical approach to be followed, the expected results, the financial plan and budget, the overall project implementation and procurement plan, and the monitoring and evaluation plan.

Protected area downgrading, downsizing and degazettement (PADD): Legal reductions in the size or protection status of parks and other protected areas, typically to gain access to natural resources inside those parks or to permit infrastructure projects to cut through them.

Protection forest: An area of forest that is characterized by average slope gradients of at least 40° and on which commercial logging is illegal; and/or is managed primarily for its beneficial effects on water and soil movement; and/or managed for its ability to protect people or assets against the impacts of destabilizing natural events or adverse climates.

Radar: A system that detects the presence, direction, distance and speed of aircraft, ships and other objects by sending out pulses of high-frequency electromagnetic waves that are reflected off the object back to the source.

Ramsar wetlands: Water-saturated land areas designated under the Convention on Wetlands, known as the Ramsar Convention, an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Range: In the context of 'ape ranges', the extent of occurrence (EOO) of each species. An EOO includes all known populations of a species contained within the shortest possible continuous imaginary boundary. It is important to note that some areas within these boundaries are unsuitable and unoccupied.

Reducing Emissions from Deforestation and Forest Degradation plus (REDD+): A United Nations initiative that goes beyond curbing the release of greenhouse gases to include the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

Regression line: An approach for modeling the relationship between two variables.

Reintroduction: The managed release of an organism into its natural habitat after life in captivity.

Remote sensing: The science of identifying, measuring and observing objects or areas from a distance, typically from aircraft or satellites.

Renewable energy: Usable power derived from natural sources whose supply is not depleted when used, such as sunlight, geothermal heat, tides and wind, in contrast to finite resources such as oil and coal. See also: **alternative energy** and **clean energy**.

Resettlement action plan: A detailed, legally binding strategy that developers must fulfill when relocating and compensating people affected by an infrastructure project.

Residual impact: In the context of the mitigation hierarchy, a negative effect that remains after the implementation of mitigation measures.

Riparian (or riverine) forest: A forest that grows alongside a body of water, such as rivers, streams and lakes. See also: **gallery forest**.

River basin development: Use, control or diversion of elements of a network of watercourses to promote economic growth, often with significant impacts on quantity, quality, sediment load, timing and predictability of the water regime, such as through hydropower development.

River reach: A segment of a river that can be distinguished from other segments by its width, habitat composition, vegetation coverage, the presence of dams or other structures, and other characteristics; distinct reaches exhibit differing natural resource problems and are evaluated separately.

River system: The natural structure within which a river flows, typically including a watershed.

RoadFree: An initiative designed to highlight the importance of roadless wilderness areas for biodiversity conservation and reductions in atmospheric carbon emissions. RoadFree helped to give rise to the **Global Roadfree Areas Map**. Available at: roadfree.org.

Roadless Forest: Designed to evaluate the benefits of road-free forests, this European Union initiative is strongly linked to EU policies on reducing illegal logging and carbon emissions resulting from forest disruption. To inform decision-making, it makes use of the **Global Accessibility Map** to identify which areas are most likely to benefit from infrastructure development and to highlight associated risks to protected areas. Available at: roadlessforest.eu.

Roadside zoo: An unaccredited zoo or roadside attraction engaged in commercial exhibition and other activities with animals, potentially including apes.

Run-of-river scheme: A hydroelectric power scheme that operates without water storage, using the flow of a river channel.

Sanctuary: A non-profit facility dedicated to providing care for orphaned, confiscated or injured wildlife.

Sentinels: A family of satellites developed for the operational needs of Copernicus, an Earth-observation program headed by the European Commission in partnership with the European Space Agency. The Sentinels provide observations such as radar images, high-resolution optical images, and data for the monitoring of atmospheric composition and global sea-surface height.

Silverback: An adult male gorilla that has reached maturity and developed silver hairs on the saddle of his back.

Smart green infrastructure: Facilities that avoid critical habitats, minimize and mitigate adverse impacts on communities and biodiversity, and compensate for any inadvertent or unavoidable damage.

Spatial resolution: The level of detail in a digital (usually satellite) image; often expressed in meters, measuring the edge length of a pixel, the smallest unit of the image. The smaller the pixel size, or the greater the number of pixels in an image, the higher the spatial resolution. Satellite images tend to be grouped into three resolution categories: low resolution (>30 m), medium (2–30 m) and high (<2 m).

Standing sale: The selling of timber as it stands in the forest, in advance of harvesting and generally by weight.

Stranded asset: An economic resource that has become obsolete or nonperforming before the end of its useful life and that is recorded as a loss.

Structural connectivity: The makeup of a landscape based on ecological attributes of the area (habitat type and composition) and its connectivity (vs. fragmentation) across a landscape, excluding behavioral patterns of organisms in the area. See also: **functional connectivity**.

Subadult: A stage of development where an individual has not yet acquired all adult characteristics.

Sustainable Development Goals (SDGs): Seventeen global aims established by the United Nations to end poverty, protect the planet and result in peace and prosperity for all. The SDGs were adopted by the 193 countries of the UN General Assembly in 2015, with specific targets to be achieved by 2030.

Swamp forest (or freshwater swamp forest): Natural forest that stands in waterlogged soil and has more than 30% canopy cover.

Sympatric: Pertaining to species or populations that occupy the same geographic ranges.

Taxon: Any unit used in the science of biological classification or taxonomy (plural: taxa).

Terawatt: A unit of power equal to one trillion watts, or one million megawatts.

Terra nullius: In international law, land that does not officially belong to anyone or any state, and that can be acquired through occupation.

Terrestrial herbaceous vegetation: Species of herbs that are staple food items for apes, such as Marantaceae and Zingiberaceae.

Terrestriality: Adaptation to living on the ground.

Toolkit for Ecosystem Service Site-based Assessment (TESSA): Guidance on low-cost methods for evaluating the benefits people receive from nature at a particular site to generate information that can be used to influence decision-making. Available at: tessa.tools.

Translocation: In conservation, the process of moving an organism from one area to another, in captive or wild settings.

Tropical Rainforest Heritage of Sumatra: A 25,000-km² (2.5 million-ha) conservation site that comprises three of Indonesia's national parks: Bukit Barisan Selatan, Gunung Leuser and Kerinci Seblat. It is home to many endangered species, including the endemic Sumatran orangutan (*Pongo abelii*).

UNESCO Man and Biosphere Reserve: Any of the 669 sites around the world that are internationally recognized for the simultaneous conservation and sustainable use of their ecosystems. Each reserve has three interrelated zones: a strictly protected core zone; a buffer zone that is used in ways that facilitate scientific research, monitoring, training and education; and a transition area that fosters sustainable human and economic development.

UNESCO World Heritage site: An area of internationally recognized cultural and natural significance, including geological and physiographical formations and precisely delineated areas that constitute the habitat of threatened animal and plant species that are of outstanding value to science or conservation.

Upstream: Towards the source of a river.

Upstream planning: Advance target setting and coordination of feasibility studies, design, implementation and operation of an investment project, usually involving collaboration among public authorities and other stakeholders, often with technical assistance.

UrtheCast: An Earth-imaging system company that specializes in geospatial analysis. Its high-resolution satellite imagery is made available on **Global Forest Watch**. Available at: www.urthecast.com.

Watershed: A tract of land drained by a river and its tributaries.

Wean: To accustom a young animal to nourishment other than the mother's milk.

Wetlands: Areas where water is sometimes or always above, at or near the surface of the soil.

Wildlife corridor: Habitat that joins two or more larger areas of similar habitat and thus allows wildlife movement, supports the viability of populations and maintains ecological processes. Corridors can occur naturally, such as riparian forests, or be created through habitat management practices.

Zero-sum game: A situation in which each participant's gain or loss of utility is exactly balanced by the losses or gains of the utility of the other participants. Suggesting that the earth's carrying capacity is a zero-sum game implies that any land, food or resources consumed or degraded by humans must ultimately incur a comparable cost to other species or ecosystems.

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