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A

Abatement. Abatement is the word which is used to denote the result of decreased Greenhouse Gases Emission. This can also be taken as an activity to lessen the effects of Greenhouse Effect.

Abiotic (factors). Non-biological (as opposed to biotic), e.g. salinity, currents, light etc.

Aboveground biomass. All living biomass above the soil including the stem, stump, branches, bark, seeds and foliage is known as aboveground biomass.

Absolute Humidity. The quantity of water vapour in a given volume of air expressed by mass is known as absolute humidity.

Absolute Risk. A quantitative or qualitative prediction of the likelihood and significance of a given impact is known as absolute risk. In the Voluntary Carbon Standard (VCS), the level of absolute risk can be calculated using the 'likelihood × significance' methodology. The calculated risk can then be converted into a risk classification.

Abys. The sunless deep sea bottom, ocean basins or **abyssal plain** descending from 2,000m to about 6,000m.

Abyssal plain. The extensive, flat, gently sloping or nearly level region of the ocean floor from about 2,000m to 6,000m depth; the upper abyssal plain (2,000–4,000m) is also often referred to as the continental rise.

Acceptable risk. The level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions is known as acceptable risk. It describes the likelihood of an event whose probability of occurrence is small, whose consequences are so slight, or whose benefits (perceived or real) are so great, that individuals or groups in society are willing to take or be subjected to the risk that the event might occur.

Access. Defined as the possibility for participation, utilization and benefit.

Accelerated Erosion. Accelerated erosion is generally caused by activities that disturb or expose the soil to the erosive forces of gravity and rainwater. Climatic or weather conditions combined with human activity can accentuate soil erosion. For example, severe and intense storm events may increase the rate of accelerated erosion.

Acclimation. Changes in the tolerance to stress of an organism under laboratory or other experimental conditions, generally over the short-term (Coles and Brown, 2003).

Acclimatization. The process of an individual organism adjusting to a gradual change in its environment (such as a change in temperature, humidity, photoperiod or pH) allowing it to maintain performance across a range of environmental conditions is known as acclimatization. It occurs in a short period of time (days to weeks), and within the organism's lifetime (compare to adaptation). This may be a

discrete occurrence or may instead represent part of a periodic cycle, such as a mammal shedding heavy winter fur in favor of a lighter summer coat. Organisms can adjust their morphological, behavioural, physical and/or biochemical traits in response to changes in their environment.

Accountability. Principle by which managers and decision makers in the government, the private sector and organized civil society are responsible towards the public for the actions they do or take within their positions.

Accretion. Deposition of material by sedimentation which increases land area.

Acid. Term applied to the water with a Ph. below 5.5.

Active processes. Natural abiotic processes that are active in the formation and evolution of landforms and materials, such as deposition of sand along the coast, deposition of sands and gravels at the margins of glaciers and ice caps, volcanic eruptions, landslides and erosion (Crofts et al., 2020).

Active systems. Features and forms, such as sand dunes, river valleys, mangroves and soils, that are still developing and evolving due to natural processes (Crofts et al., 2020).

Adaptability. The ability of a system to adjust to Climate Change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities or to cope with the consequences is known as adaptability.

Adaptation. Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Various types of adaptation exist, e.g. anticipatory and reactive, private and public, and autonomous and planned.

Adaptation assessment. The practice of identifying options to adapt to climate change effects and evaluating them in terms of criteria such as availability, benefits, costs, effectiveness, efficiency and feasibility is known as adaptation assessment.

Adaptation baseline. Any datum against which change is measured is known as adaptation baseline. It might be a “current baseline,” in which case it represents observable present-day conditions or a “future baseline,” which is a projected future set of conditions excluding the driving factor of interest. Alternative interpretations of the reference conditions can give rise to multiple baselines.

Adaptation benefits. The avoided damage costs or the accrued benefits following the adoption and implementation of adaptation measures is known as adaptation benefits.

Adaptation cost. Costs of planning, preparing for, facilitating and implementing adaptation measures including transition costs is known as adaptation cost.

Adaptation deficit. Failure to adapt adequately to existing climate risks largely accounts for adaptation deficit. Development decisions that do not properly consider current climate risks add to the costs and increase the deficit. As Climate Change accelerates, the adaptation deficit has the potential to rise much higher unless a serious adaptation program is implemented.

Adaptation fund. Fund which was established to finance concrete adaptation projects and programmes in developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of Climate Change is known as adaptation fund.

Adaptive management. A systematic process of continually improving management policies and practices by learning from the outcomes of existing programmes.

Adaptation measures. Measures can be individual interventions or they consist of packages of related measures. Specific measures might include actions that promote the chosen policy direction, such as implementing an irrigation project or setting up a farmer information, advice and early warning programme. Policies, generally speaking, refer to objectives together with the means of implementation.

Adaptation method. A set and sequence of steps or tasks that should be followed to accomplish the task that represents a part of large framework is known as adaptation method. Examples include methods for development and use of scenario data in the vulnerability and adaptation assessment.

Adaptation policy baseline. Any datum against which change is measured is known as adaptation policy baseline. It includes a description of adaptations to current climate that are already in place (e.g. existing risk mitigation policies and programmes).

Adaptation policy framework (APF). Structural process for developing adaptation strategies, policies, and measures to enhance and ensure human development in the face of Climate Change including climate variability is known as adaptation policy framework. The APF is designed to link Climate Change adaptation to sustainable development and other global environmental issues. It consists of five basic components scoping and designing an adaptation project, assessing current vulnerability, characterizing future climate risks, developing an adaptation strategy and continuing the adaptation process.

Adaptation strategies. These are long-term changes in behaviour and practice in response to continuing stresses. They are the responses of people to their analysis of risk. For example, they might start rainwater harvesting or they may try to diversify their livelihood activities and focus on those less affected by natural hazards. Certain family members may migrate to another place.

Adaptation technologies. It includes both scientific and traditional technologies. Most adaptation technology focuses on local innovations, knowledge and practices that are effective in adapting to climatic hazards. The application of technology in order to reduce the vulnerability or enhance the resilience of a natural or human system to the impacts of Climate Change.

Adaptive capacity. The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities or to cope with the consequences is known as adaptive capacity. The potential to adjust in order to minimize negative impacts and maximize any benefits from changes in climate is known as adaptive capacity.

Additionality. The action of impacts that would not have occurred without an intervention.

Adverse effect. Changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socioeconomic systems or on human health and welfare is known as adverse effect.

Aerosols. A collection of airborne solid or liquid particles, with a typical size between 0.01 and 10 μm that reside in the atmosphere for at least several hours is known as aerosols. Aerosols may be of either natural or anthropogenic origin. Aerosols may influence climate in two ways: directly through scattering and absorbing radiation and indirectly through acting as condensation nuclei for cloud formation or modifying the optical properties and lifetime of clouds.

Afforestation. The activity of afforestation is defined as the transformation of areas where organized trees did not previously exist in the forest.

Aggregate impacts. Total impacts summed up across sectors and/or region are known as aggregate impacts. Measures of aggregate impacts include the total number of people affected, change in net primary productivity, number of systems undergoing change or total economic costs.

Agricultural intensification. Practices intended to produce higher crop yields without increasing cultivated land area.

Agricultural land. Agricultural land refers to the share of land area that is arable, under permanent crops, and under permanent pastures. Arable land includes land defined by the Food and Agricultural Organization (FAO) of the United Nations as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded (IUCN, 2021).

Agrobiodiversity. Includes wild plants closely related to crops (crop wild relatives), cultivated plants (landraces) and livestock varieties. Agrobiodiversity can be an objective of protected areas for crop wild relatives, traditional and threatened landraces, particularly those reliant on traditional cultural practices; and/or traditional and threatened livestock races, especially if they are reliant on traditional cultural management systems that are compatible with “wild biodiversity”.

Agroclimatology. The study of climate as to its effect on crops; it includes, for example, the relation of growth rate and crop yields to the various climatic factors and hence the optimum and limiting climates for any given crop is known as agroclimatology.

Agroecology. The application of ecological principles to the production of food, fuel, fiber and pharmaceuticals is known as agroecology. The term encompasses a broad range of approaches and is considered a science, a movement and a practice.

Agro-forestry. An ecologically based natural resource management system in which trees are integrated in farmland and rangeland is known as agroforestry.

Algae. Simple plant-like organisms that contain chlorophyll but lack roots, stems or leaves.

Alkaline. Term applied to water with a Ph. above 7.4.

Allele. A form of a gene at a particular position (locus) on a chromosome (Redford et al., 2019).

Allochthonous. Originating from outside a system.

Alluvial fan. Formed when streams run off mountains in deep gorges to plains below and deposit rock material.

Alpine zone. The area above the altitudinal treeline in mountainous areas.

Anaerobic. Condition where the oxygen molecules are absent from the environment.

Anal fin. A single fin on the ventral surface of the tail between the pelvic fins and caudal fin of some sharks, absent in batoids, dogfish, sawsharks, angel sharks and some chimaeras.

Ancillary benefits. The ancillary or side effects of policies aimed exclusively at Climate Change mitigation. Such policies have an impact not only on greenhouse gas emissions but also on resource use efficiency like reduction in emissions of local and regional air pollutants associated with fossil-fuel use and on issues such as transportation, agriculture, land-use practices, employment, and fuel security. Sometimes these benefits are referred to as “ancillary impacts”.

Angiosperm. Flowering plant.

Annual. A plant that completes its entire life cycle from seed to flower to seed again within one year.

Anoxic. Without (completely lacking) O₂.

Anthropogenic. Of, relating to, or resulting from the influence of humans on nature.

Aquaculture. Several management procedures, designed to increase the production of live aquatic organisms, to levels above those normally obtained from natural fish captures. **Exposed A--.** Aquaculture is usually defined as “exposed aquaculture” when “cage aquaculture is developed in marine areas not protected by the coastline from adverse marine conditions”. **Integrated A--.** According to FAO, “Integrated aquaculture is an aquaculture system sharing resources such as water, feeds and management, with other activities; commonly agricultural, agro-industrial, infrastructural (wastewaters, power stations, etc.)”. Nevertheless, “the raising of several organisms in the same aquaculture facility, where the volume of residues of one species is used as food by another species” is accepted in aquaculture. This system reduces the total volume of residues of the aquaculture facility, increasing the total biomass production. **Sheltered A--.** Aquaculture is usually defined as “sheltered aquaculture” when “cage aquaculture is developing in marine areas protected by the coastline from adverse marine conditions.”

Aerobic. Process in which O₂ is involved, e.g. aerobic respiration.

Anticipatory adaptation. Adaptation that takes place before an impact of climate change is observed is known as anticipatory adaptation.

Aquifer. A formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs for that unit to have economic value as a source of water in that region.

Area of occupancy. The area within its **extent of occurrence** which is occupied by a **taxon**, excluding cases of vagrancy. This reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may contain unsuitable or unoccupied habitats. In some cases the area of occupancy is the smallest area essential at any stage of the life cycle to the survival of existing populations of a taxon.

Arbitrator. An independent third party who listens to conflicting arguments put forward by interested parties and states which one will win.

Aridity Index. The Aridity Index is a measure of the mean annual precipitation divided by the potential evapotranspiration. $AI = P/PET$.

Arid Land. Arid land is the portion of land with an Aridity Index of 0.05–0.20. Arid lands include areas colloquially known as deserts and rangelands. See *Drylands*.

Armed conflict. Armed conflict can be considered as synonymous with violent conflict, encompassing both “international armed conflicts” and “non-international armed conflicts, between governmental forces and nongovernmental armed groups, or between such groups only”.³²⁵ The term *armed conflict* is used throughout this report to maintain consistency with the Uppsala Conflict Data Program, except on a few occasions where the conflict in question does not meet this definition (IUCN, 2021).

Artisanal fishery. Small-scale traditional fisheries involving fishing households (as opposed to commercial companies) which input a relatively small amount of capital and energy and catch fish mainly for local consumption, however the catch may be exported. Artisanal fisheries can be **subsistence fisheries** or **commercial fisheries**.

Autonomous adaptation. Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems.

Autosome. Chromosomes which are not sex chromosomes (such as X and Y in mammals) (Redford et al., 2019).

Autotroph. An organism capable of making its own food nutrients or simple organic substances.

Avifauna. Bird fauna of an area or period.

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B

Bacterium. A living being made up of a single cell considered as being neither an animal nor a plant.

Badlands. Areas of little or no economic value, generally devoid of vegetation, with rugged terrain and poor access; often with fluvial erosion features.

Baleen. A kind of brushes that adorn the lower jaw of some whales, acting as a filter that allows the water to flow through while retaining the solid nutrients.

Bali Roadmap. Action plan agreed at UN Climate Change Conference in 2007 to achieve a secure climate future.

Basin. The low point in a catchment where surface water collects; also called base level.

Bathyal. Benthic habitats from 200m to 4,000m depth.

Bathymetric distribution. The vertical distribution of a marine organism, referring to its depth of occurrence.

Bathypelagic zone. That part of the oceans beyond the continental and insular shelves and above the middle and lower continental rises and **abyssal plain**; the sunless zone from about 1,000m to 3,000–6,000m.

Batoid. A ray or flat shark, a species of the **order** Rajiformes: the sawfishes, sharkrays, wedgefishes, guitarfishes, thornrays, panrays, electric rays, skates, stingrays, stingarees, butterfly rays, eagle rays, cownose rays and devil rays.

Bayesian belief network. A model for representing uncertainties in knowledge (Wooldridge & Done, 2004).

Beach. Sloping ground on the shore of a large amount of salt water bodies, generated by the surge and the currents, which extends over a considerable distance.

Beach meshing. An active fishing method utilising nets or baited drumlines designed to remove sharks from the local area for the purpose of bather protection. Employed only in Queensland and New South Wales in Australia and KwaZulu-Natal in South Africa.

Beach nourishment. The artificial supply of material, usually sand, to a beach from another source, often offshore, to help to maintain the stability of the beach and reduce erosion of the coastline (Crofts et al., 2020).

Belowground biomass. All living biomass of live roots is known as belowground biomass. Fine roots of less than ~2mm diameter are sometimes excluded because these often cannot be distinguished empirically from soil organic matter or litter.

Benches. Natural or man-made step-like terraces; benches in an open-pit mine are formed when successive layers are removed; benches are also safety features that serve to catch any loose rock that starts to roll down the side of an open pit.

Benefit Cost Ratio (BCR). A measure of project desirability or profitability: the ratio between the discounted total benefits and costs of a project.

Benign introduction. An attempt to establish a species for the purpose of conservation: outside their recorded distribution, but within an appropriate habitat and eco-geographical area. This is a feasible conservation tool only when there is no remaining area left within the species' historic range.

Benthic. Connected with, or living near, the sea bottom.

Bequest value. A component of Total Economic Value: a non-use value derived from the desire to pass on natural resources and ecosystems to future generations.

Best practice. Best practice is a superior or innovative method that contributes to the improved performance of an organization, and is usually recognised as 'best' by other peer organizations. It implies accumulating and applying knowledge about what works and what does not work in different situations and contexts, including learning from experience, in a continuing process of learning, feedback, reflection and analysis (on what works, how and why).

Biennial. Plants which live for two years. Usually the first year's growth produces a leaf-rosette, the second the flowers.

Bioaugmentation. The addition of archaea or bacterial cultures required to speed up the rate of degradation of a contaminant (Redford et al., 2019).

Biocarbon. The basic premise of 'biocarbon' is to combine climate mitigation and biodiversity conservation in the same activity, usually through afforestation, reforestation or the conservation or enhancement of existing biomass.

Biocenose. All the interacting organisms living together in a specific habitat.

Bioclimatology. The interdisciplinary field of science that studies the interactions between the biosphere and the Earth's atmosphere on time scales of the order of seasons or longer is known as bioclimatology.

Biodiesel. Diesel replacement composed of methyl (or ethyl) esters of long chain fatty acids derived from plant oils such as rapeseed, palm oil and soy.

Biodiversity, biological diversity. The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (CBD, Art. 2, 1992).

Biodiversity business. A commercial enterprise that generates profits through production processes which conserve biodiversity, uses biological resources sustainably, and shares the benefits arising out of this use equitably.

Biodiversity management services. Biodiversity management services (BMS) include a range of professional activities and services undertaken by public and private entities that deliver benefits for biodiversity, for which a fee is received by the service provider.

Biodiversity offset. Biodiversity offsets are conservation actions intended to compensate for the residual, unavoidable impact on biodiversity caused by

development projects, to ensure at least no net loss of biodiversity and, where possible, a net gain.

Bio-economic model. A model of ecological and socio-economic reality that allows us to express the consequences of different management regimes on ecosystem values.

Bioenergy. Energy produced from biomass whether for heat, electricity or transport.

Bio-engineering. The application of concepts and methods of physics, chemistry and mathematics to solve problems in life sciences using engineering's own analytical and synthetic methodologies is known as bio-engineering.

Bioerosion. The erosion of substrate by means of biological procedures (Neumann, 1966).

Bioethanol. Petrol replacement produced from sugar or starch crops such as sugarcane, sugarbeet, corn and wheat.

Biofouling. Marine biological fouling, usually termed marine biofouling, is the undesirable accumulation of microorganisms, plants, and animals on surfaces immersed in sea water.

Biofuels. Liquid or gaseous fuels produced from biomass that can be used to replace petrol, diesel and other transport fuels. **First Generation.** Biofuels produced from existing food and feed crops using simple and well established processing technologies (nearly all biofuels are currently first-generation). **Second Generation.** Biofuels produced from a wider range of cellulosic biomass including agricultural wastes and plant species grown specifically for their biomass such as switchgrass and willow and converted using more advanced thermo-chemical or bio-chemical processes. **Third Generation.** Potential future biofuels produced from "energy-designed" feedstocks with much higher production and conversion efficiencies than current biofuels.

Biogas. Gas produced from anaerobic digestion or fermentation of biomass and composed mainly of methane and carbon dioxide. Biogas can be burnt to produce heat and/or electricity or upgraded for use in vehicles that run on Compressed Natural Gas (CNG) or Liquid Petroleum Gas (LPG).

Biogeography. A study of the geographical distribution of biodiversity over space and time.

Biogeographical region. An area of animal and plant distribution having similar or shared characteristics throughout.

Biological community. Community of plants, animals and other organisms of particular area is known as biological community.

Biological control agents. Living organisms used to eliminate or regulate the population of other living organisms.

Biological corridor. Area of suitable habitat, or habitat undergoing restoration, linking two or more protected areas (or linking important habitat that is not protected) to allow interchange of species, migration, gene exchange, etc.

Biological diversity values. The intrinsic, ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components. (CBD, 1992).

Biological extinction. The complete disappearance of a species from the Earth.

Biological Hazard. Process or phenomenon of organic origin or conveyed by biological vectors including exposure to pathogenic micro-organisms, toxins and bioactive substances that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption or environmental damage is known as biological hazard.

Biological resources. The genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with real or potential value or usefulness to human beings.

Biomass. The total weight, volume or quantity of organisms in a given area.

Biome. A major portion of the living environment of a particular region (such as a fir forest or grassland), characterized by its distinctive vegetation and maintained largely by local climatic conditions.

Biosphere. The parts of the Earth's land, sea and air that support life.

Biophysical. Environmental factors which involve biotic and physical (abiotic) aspects and characteristics.

Bioprospecting. The systematic search for genes, compounds, designs, and organisms that might have a potential economic use and might lead to a product development.

Bioregion. An area where groups of animals and plants and physical features are distinct from those of surrounding areas. If one takes any slab of a bioregion, it should represent the biodiversity of assemblages, structure and environment as well as any other slab of the same bioregion (Done, 2001).

Biosafety. Defined as the safe transfer, handling and use of any living modified organism resulting from biotechnology.

Biosecurity. The control of risks derived from the transference, manipulation and utilization of living organisms modified as a result of biotechnology and its effects on the environment and human health. According to the Cartagena Protocol (CBD), biosecurity should guarantee: "an adequate level of protection regarding the safe transference, manipulation and utilization of living organisms modified as a result of modern biotechnology that may have adverse effects on the conservation and sustainable utilization of the biological diversity, including the risks posed to human health, and specifically focusing on trans-bordering activities".

Biosphere. The total range of living beings and their environment that comprises the lithosphere (surface of the earth), the hydrosphere (earth waters) and the atmosphere, which is almost 15 Km thick from the surface of the earth.

Biostabilizer. A machine that converts solid waste into compost by grinding and aeration is known as biostabilizer.

Biota. All species of living things (plants and animals) within a particular territory or area. It refers to the living weight of all organisms within a particular area or habitat. It is, sometimes, expressed as a weight per unit of land area or unit of water volume.

Biotechnology. Any technological application using biological resources, living organisms or their byproducts, for the creation or modification of products or processes for specific uses.

Biotic (factors). Belonging to, or caused by, the living organisms (as opposed to abiotic), e.g. grazing.

Biotopo. Area inhabited by a specific group of living organisms.

Bivalve. A mollusc characterized by a shell in two parts joined by a hinge (oyster, cockle).

Black Carbon. A climate forcing agent formed through the incomplete combustion of fossil fuels, bio-fuel and biomass and emitted in both anthropogenic and naturally occurring soot is known as black carbon. It has recently emerged as a major contributor to global climate change, now attributed as the second largest contributor to global warming. Black carbon particles absorb sunlight and give soot its black color. It consists of pure carbon in several linked forms. Primary sources include emissions from diesel engines, cook stoves, wood burning and forest fires. Black carbon warms the Earth by absorbing heat in the atmosphere and by reducing albedo, the ability to reflect sunlight, when deposited on snow and ice. It remains in the atmosphere for only a few weeks.

Booming. Typical vocalisations of displaying male prairie chickens.

Booming ground. The display ground of prairie chickens.

Boreal zone. The biogeographical region situated between the temperate and the Arctic zones and which is dominated by coniferous forest.

Bottleneck (population). An ecological event that drastically reduces a population producing evolutionary impacts (Redford et al., 2019).

Bottom trawling. A fishing method that involves towing trawl nets along the sea floor. Bottom trawling can cause serious damage to sea floor habitats.

Bribery. Offering, giving, receiving, or soliciting of any item of value to influence the actions as an official or other person in discharge of a public or legal duty.

Buffer zone. Areas between core protected areas and the surrounding landscape or seascape which protect the network from potentially damaging external influences and which are essentially transitional areas.

Bushes. Areas dominated by vegetation which height is less than 6 m.; it includes bushes, young trees and small bushes and badly shaped bushes (forked, bent).

Bycatch. Animals caught by accident in fishing gear; species that the fishers do not intend to catch. These can include, for example, marine mammals, sea turtles, sea birds and sharks.

Byproduct. The part of the catch which is retained due to their commercial value, but which is not the primary target species. See *Target catch*.

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C

Cages. A rearing facility enclosed on the bottom as well as on the sides by wooden, mesh or net screens. It allows natural water exchange through the lateral sides and in most cases below the cage (FAO).

Calcareous soils. Those formed on calcium carbonate rich rocks such as limestone or chalk. Lime-rich soils have a different and usually richer association of plants than acid soils.

Calcification. A process by which the mineral calcium builds up in tissue, causing it to harden. Scleractinian corals produce aragonite (CaCO₃) skeletons via this process (Marshall, 1996).

Cambrian Explosion. Period of geological time (see *Geological timescale*) when a major increase in species was recorded in the rocks of that age (Crofts et al., 2020).

Cancritrophic. Having a diet specializing in crustacean prey.

Canopy cover. The proportion of the forest floor shielded by the leaves and branches of the trees.

Cap / Regulatory cap. A maximum level, for example of pollutant loads, that is mandated by law.

Cap-and-trade schemes. Watershed services payment schemes in which aggregate levels (caps) are determined, for example, for the release of pollutants, and then the right to release pollutants is traded among participating entities.

Capsule. A dry fruit that when mature splits apart to release the seeds within.

Carbon. Organic form of carbon, which is the main element of living beings (organic matter).

Carbon accounting system. The accounting process undertaken to measure the amount of carbon dioxide equivalents that will not be released into the atmosphere as a result of Flexible Mechanisms projects under the Kyoto Protocol is known as carbon accounting system. These projects include (but are not limited to) renewable energy projects and biomass, forage and tree plantations.

Carbon credits. Greenhouse gas emission reductions or removals generated by a project activity that can be bought or sold through the Clean Development Mechanism or joint implementation.

Carbon cycle. The bio-geochemical cycle in which carbon moves through the biosphere.

Carbon finance. Carbon finance is a new branch of environmental finance. It explores the financial implications of living in a carbon-constrained world, in which carbon dioxide and other greenhouse gas emissions (GHGs) carry a price. The general term is applied to investments in GHG emission reduction projects and the creation of financial instruments that are tradable on the carbon market.

Carbon footprint. The total set of greenhouse gas emissions caused by an organization, event or product is known as carbon footprint.

Carbon intensity. The amount of emission of carbon dioxide per unit of Gross Domestic Product is known as carbon intensity.

Carbon leakage. The part of emissions reductions in Annex B countries that may be offset by an increase of the emissions in the non-constrained countries above their baseline levels is known as carbon leakage. This can occur through (1) relocation of energy-intensive production in non-constrained regions; (2) increased consumption of fossil fuels in these regions through decline in the international price of oil and gas triggered by lower demand for these energies; and (3) changes in incomes (thus in energy demand) because of better terms of trade.

Carbon market. A market where carbon shares are traded. Carbon shares are also known as pollution credits. Carbon market functions with a limit on allowable level of emissions. Polluters who are under this set cap can sell their excess emission rights to those concerns who have crossed this cap.

Carbon offset. The result of any action specifically undertaken to prevent the release of carbon dioxide into the atmosphere and/or to remove it from the atmosphere in order to balance emissions taking place elsewhere.

Carbon offsetting. A way of compensating for emissions of CO₂ by participating in, or funding, efforts to take CO₂ out of the atmosphere.

Carbon pools. A reservoir of carbon that has the potential to accumulate (or lose) carbon over time. In Agriculture Forestry and Other Land Use (AFOLU), this encompasses aboveground biomass, belowground biomass, litter, dead wood and soil organic carbon.

Carbon rights. A carbon right is a new and unique form of land interest that confers upon the holder a right to the intangible benefit of carbon sequestration on a piece of forested land.

Carbon sequestration. Carbon sequestration is a biochemical process by which atmospheric carbon is absorbed by living organisms, including trees, soil micro-organisms, and crops, and involving the storage of carbon in soils, with the potential to reduce atmospheric carbon dioxide levels.

Carbon sink. A carbon pool that is increasing in size is known as carbon sink. A carbon pool can be a sink for atmospheric carbon if during a given time interval more carbon is flowing into it than out of it.

Carbon stock. The quantity of carbon held within a pool is known as carbon stock. It is measured in metric tons of CO₂.

Carbon substitution. The substitution of carbon intensive products with harvested [sustainable] wood products or substitution of fossil fuel with bio-fuels is known as carbon substitution.

Carbonaceous aerosol. An aerosol consisting predominantly of organic substances and various forms of black carbon is known as carbonaceous aerosol.

Carbonate rocks. See *Rocks*.

Carcharhinoid. A ground shark, a member of the **order** Carcharhiniformes and including the catsharks, false catsharks, finback catsharks, barbeled houndsharks, houndsharks, weasel sharks, requiem sharks and hammerheads.

Carnivore. An animal that eats other animals.

Carrying capacity. According to FAO, "Carrying capacity is the amount of a given activity that can be accommodated within the environmental capacity of a defined area". In aquaculture: "usually considered to be the maximum quantity of fish that any particular body of water can support over a long period without negative effects to the fish and to the environment".

Cartilaginous fishes. Species of the **class Chondrichthyes**, whose skeleton is composed of flexible cartilage instead of bone.

Catchment. The whole area of a river system from its source to its mouth, including all of its tributaries and the land between the water courses (Crofts et al., 2020).

Caudal fin. The fin on the end of the tail in sharklike fishes, lost in some batoids.

Cephalopod. A mollusc characterized by arms with tentacles and suckers.

Certification. Certification means demonstrating that a product or process meets certain standards. This confirmation is in addition to the producer's general information provided on ordinary labels and is usually, although not always, provided by means of an external assessment.

Certification schemes. Watershed services payment schemes in which payments are embedded in the premium price paid for a certified traded product.

Certified Emission Reductions (CERs). A type of emissions unit (or carbon credits) issued by the Clean Development Mechanism (CDM) Executive Board for emission reductions achieved by CDM projects and verified by a Department of Energy (DoE) under the rules of the Kyoto Protocol. CERs are either long-term (ICER) or temporary (tCER), depending on the likely duration of their benefit.

Chain of custody (forestry). The channel through which products are distributed from their origin in the forest to their end-use.

Channelization. The straightening of rivers or streams by means of an artificial channel.

Chlorofluorocarbons. Greenhouse gases covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants is known as chlorofluorocarbons. As they are not destroyed in the lower atmosphere, CFCs drift into the upper atmosphere where given suitable conditions they break down ozone. These gases are being replaced by other compounds, including hydro chlorofluorocarbons and hydrofluorocarbons, which are greenhouse gases covered under the Kyoto Protocol.

Chloroplast. Cell organelle in which photosynthesis takes place.

Choice experiment valuation methods. A Stated Preference Approach technique for valuing ecosystems or environmental resources that presents a series of alternative resource or ecosystem use options, each of which is defined by various

attributes including price, and uses the choices of respondents as an indication of the value of ecosystem attributes.

Circumglobal. Distributed worldwide.

Circumpolar distribution. “Surrounding the pole”, i.e. occurring around the globe.

Circumtropical. Distributed throughout tropical regions worldwide.

Cirque. A large amphitheatre-like form at the head of a mountain valley formed by glacial erosion and the action of frost and the consequent failure of the adjacent rock walls (Crofts et al., 2020).

City climate. Climate characteristic of the interior of a landmass of continental size marked by large annual, daily and day-to-day temperature ranges, low relative humidity and a moderate or small irregular rainfall. Annual extremes of temperature that occur soon after the solstices is known as city climate.

Civil society. The sphere of autonomous institutions, protected by the law, where men and women may carry out their work freely and independently from the state.

Clade. A biological group of species that shares features inherited from a common ancestor (Houghton Mifflin, 2003).

Class. One of the taxonomic groups of organisms, containing related **orders**; related classes are grouped into phyla.

Classification. The ordering of organisms into groups on the basis of their relationships, which may be by similarity or common ancestry.

Clean Development Mechanism. The Clean Development Mechanism is intended to meet two objectives: (1) to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the convention; and (2) to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments. Certified Emission Reduction Units from Clean Development Mechanism projects undertaken in Non-Annex I countries that limit or reduce greenhouse gas emissions, when certified by operational entities designated by Conference of the Parties/Meeting of the Parties can be accrued to the investor (government or industry) from Parties in Annex B. A share of the proceeds from the certified project. A mechanism under the Kyoto Protocol through which developed countries may finance greenhouse gas emission reduction or removal projects in developing countries and receive credits for doing so which they may apply towards meeting mandatory limits on their own emissions is known as clean development mechanism (Kyoto Protocol, Art. 12).

Climate. Climate in a narrow sense is usually defined as the ‘average weather’ or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands of years. The classical period is 30 years, as defined by the World Meteorological Organisation (WMO). These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

Climate change. Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that

in the United Nations Framework Convention on Climate Change (UNFCCC), which defines 'climate change' as: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods". See also **climate variability**.

Climate change adaptation. Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities is known as Climate Change Adaptation.

Climate change adaptation strategy. A general plan of action of any country for addressing the impacts of Climate Change including climate variability and extremes is known as Climate Change Adaptation Strategy of a country. It may include a mix of policies and measures selected to meet the overarching objective of reducing the country's vulnerability.

Climate change impacts. The effect of Climate Change on natural and human systems. Depending on the consideration of adaptation, one can distinguish between potential impacts and residual impacts.

Climate change mitigation. Strategies and policies that reduce the concentration of greenhouse gases in the atmosphere either by reducing their emissions or by increasing their capture is known as Climate Change Mitigation.

Climate change vulnerability assessment. A range of tools that exist to help communities understand the hazards that affect them and take appropriate measures to minimize their potential impact is known as Climate Change Vulnerability Assessment.

Climate hazard. The harmful effect of Climate Change on livelihoods and ecosystems is known as climate hazard. They can be caused by gradual climate variability or extreme weather events. Some hazards are continuous phenomena that start slowly such as the increasing unpredictability of temperatures and rainfall. Others are sudden but relatively discrete events such as heat waves or floods.

Climate prediction. A climate prediction or climate forecast is the result of an attempt to produce a most likely description or estimate of the actual evolution of the climate in the future (for e.g. at seasonal, inter-annual or long-term time-scales).

Climate risk. The likelihood that the harmful effects will happen is known as climate risk or it is a measure of the probability of harm to life, property and the environment that would occur if a hazard took place. Risk is estimated by combining the probability of events and the consequences that would arise if the events took place. It denotes the result of the interaction of physically defined hazards with the properties of the exposed systems i.e. their sensitivity or social vulnerability.

Climate Sensitivity. A measure of how responsive the temperature of the climate system is to a change in the radiative forcing is known as climate sensitivity. It is usually expressed as the temperature change associated with a doubling of the concentration of carbon dioxide in Earth's atmosphere.

Climate Shift. An abrupt shift or jump in mean values signaling a change in climate regime is known as climate shift. Most widely used in conjunction with the 1976/1977 climate shift that seems to correspond to a change in El Niño-Southern Oscillation behaviour.

Climate variability. Climate variability refers to variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability). See also **climate change**.

Climax species. Species which are stable and capable perpetuating themselves.

Climax vegetation. The final stage of vegetational succession.

Clone. Organisms having identical genome.

Close season. Period of time during which the exploitation of all types of activities is suspended, due to a decrease in wild populations, as a result of unforeseen natural phenomena or disasters that affect the distribution and stability of the species.

Closed population. A population that is self-seeding and receives its recruits primarily as larvae produced from spawning by its own residents.

Closure. A population achieves closure when the life cycles of its members are such that offspring remain within it, or return to become members of the reproductive assemblage (Mora & Sale, 2002).

Coalitions. Groups or individuals who deliberately collaborate or 'co-align' to effect greater changes than could be achieved than acting alone. Together, groups exploit a 'middle ground' of shared interests.

Coast. The strip of land that lies immediately after the sea on the dry land, covering the area that is directly affected by the ocean. It includes cliffs, lowlands (coastal plains), steep marine terraces, swamps and lagoon systems.

Coastal. It refers to the habitats extending from the coast limits to an underwater depth of 2 m.

Coastal cells. A unit of subdivision of the coast where the sediment circulates within fixed boundaries, usually defined by headlands (Crofts et al., 2020).

Coastal area. Area delimited at its uppermost part by the maximum level of high tide up to a depth of about 200 m. The area located between 60 and 200 m. is generally called sub-coastal.

Coastal Zone Management. Coastal zone management can be defined as "the management of the coastal and marine areas and resources in order to have a sustainable use, development and protection".

Codend. The end of a fishing net in which the catch collects.

Code of conduct. Codes of conduct are sets of written principles and expectations that, although voluntary, are considered binding on any person or organization that belongs to a particular group that adopts the code.

Coloured Dissolved Organic Matter (CDOM). Also known as gelbstoff, it primarily consists of humic acids produced by the decomposition of plant litter and organically

rich soils in coastal and upland areas. Levels can be augmented by fulvic acid produced by coral reefs, seaweed decomposition or industrial effluents (Keith et al, 2002). CDOM absorbs UV radiation and can protect coral reefs against bleaching (Otis et al, 2004).

Co-management. Also known as participatory management, involves an institutional arrangement between the local users of a territory or set of natural resources and/or groups interested in its conservation, and public entities responsible for the administration of said resources. The process leads to the development of community skills to enable them to effectively undertake a biodiversity conservation role.

Commercial fishery. A fishery targeting species which are retained and sold for their commercial value.

Common Fisheries Policy (CFP). A European Union policy for fisheries management. The common fisheries policy includes a body of rules and mechanisms covering the exploitation, processing and marketing of living aquatic resources and aquaculture. These activities are carried out in the territories of the Member States or in the European Community fishing zone (waters under the sovereignty or jurisdiction of the Member States), or by fishing vessels flying the flags of Member States in the waters of non-member countries or in international waters.

Common name. The informal vernacular name for an organism, which may vary from location to location.

Community Conserved Area. Natural and modified ecosystems, including significant biodiversity, ecological services and cultural values, voluntarily conserved by indigenous peoples and local and mobile communities through customary laws or other effective means.

Complementary good. A good or service that is used in conjunction with another.

Condensation. The process by which a vapour becomes a liquid.

Condition. It refers to the conditions under which people live, that is, how they live. It specifically points towards the so called practical needs (poverty, access to services, productive resources, health care and education, among others).

Conflict event. A conflict event is “An incident where armed force was used by an organised actor against another organised actor, or against civilians, resulting in at least 1 direct death at a specific location and a specific date”. A conflict can be made up of multiple conflict events (IUCN, 2021).

Coniferous forest. Coniferous forests are naturally found in the northern hemisphere, in cold and temperate zones and, in a smaller proportion, in similar zones of the southern hemisphere. In the vegetable kingdom, coniferous are found in smaller numbers than broad leaves.

Connectivity (reefs). Natural links among reefs and neighbouring habitats, especially seagrass beds, mangroves, and back-reef lagoons that provide important fish nurseries and nutrients, and watersheds and adjacent coastal lands, which are sources of freshwater, sediments and pollutants. The mechanisms include ocean currents, terrestrial run-off and water courses, larval dispersal, spawning patterns, and movements of adult fishes and other animals. Connectivity is an important part of

dispersal and replenishment of biodiversity on reefs damaged by natural or human-related agents.

Consensus. An agreement that is reached by identifying the interests of all concerned parties and then building an integrative solution that maximises satisfaction of as many of the interests as possible. It does not mean unanimity, as it does not satisfy all participants' interests equally.

Conservation. The protection, care, management and maintenance of ecosystems, habitats, wildlife species and populations, within or outside of their natural environments, in order to safeguard the natural conditions for their long-term permanence.

Conservation capacity. The ability to perform functions, solve problems and set and achieve objectives in conservation, encompassing policy, practice, collaboration, leadership and interdisciplinarity (IUCN, 2021).

Conservation *ex situ*. The conservation of the components of the biological diversity outside of their natural habitats.

Conservation *in situ*. The conservation of the ecosystems and natural habitats and maintenance and recovery of viable populations of species in their natural environments and, in the case of tame and cultivated species, in the environments where they have developed their specific characteristics.

Conservation tillage. Tillage practices (including no-till, mulch till and ridge till) that leave beneficial plant materials (leaves, stalks, etc.) from previous crops on the soil surface, thus maintaining or enhancing soil carbon stocks.

Conserving nature's stage. A relatively modern concept based on flora and fauna being the 'actors' with geodiversity as the 'stage' on which they thrive. It underlines the importance of the interdependence between biodiversity and geodiversity and their coordinated conservation (Crofts et al., 2020).

Consolidation. The settling or establishment of an expanded distribution of an alien species that is becoming invasive.

Consortium. A partnership. For example, forest consortia in Italy are legal management entities consisting of public and private forest owners.

Consumer surplus. The difference between the value of a good and its price, in other words the benefit over and above what is paid that is obtained by a consumer who is willing to pay more for a good or service than is actually charged.

Containment. The restriction (by human hand) in area or range of a species that is spreading –possibly to become invasive – with intention to stop the spread to new areas.

Continental shelf. The gently sloping, shelf-like part of the seabed adjacent to the coast extending to a depth of about 200m.

Continental slope. The often steep, slope-like part of the seabed extending from the edge of the **continental shelf** to a depth of about 2,000m.

Contingent Valuation methods (CVM). A Stated Preference Approach technique for valuing ecosystems or environmental resources that elicits expressions of value from respondents for specified increases or decreases in the quantity or quality of an environmental good or service, under the hypothetical situation that it would be available for purchase or sale. This yields their willing to pay (WTP) for the quality of quality of the good or service under question, or willingness to accept compensation (WTA) for its loss.

Control. Refers to the authority, property and power of decision. In some circumstances, women may have access (the possibility of using) to a resource, land, for example, and have a limited control over it (they are not allowed to decide whether to sell or rent it).

Convergent evolution. A common trait in unrelated lineages.

Coppice woodland. Thicket of small trees maintained by regular cutting of stems.

Coral bleaching. The paling of corals resulting from a loss of symbiotic algae. Bleaching occurs in response to physiological shock in response to abrupt changes in temperatures, salinity and turbidity. See also *Mass coral bleaching*.

Coral reef. A marine ridge or mound that has been built up over thousands of years from limestone (calcium carbonate) deposited in the skeletons of coral polyps. The term coral reef is often used to refer to the entire ecosystem: the coral, the substrate built by the coral and the organisms that live in, on and around the reef. The geographical shape of a reef can also be part of the definition: fringing reefs, barrier reefs and atolls.

Coral surface microlayer. A protective layer of highly-productive mucus on the surface of corals. It is just millimetres thick but protects corals from UV-radiation (Aas et al., 1998).

Coralline algae. Algae species that form solid calcium carbonate accretions.

Corallivore. An organism that eats coral (NOAA, 2005).

Corporate Social Responsibility (CSR). An “umbrella” concept that not only benefits a company's financial bottom line, but also its environmental and social bottom line. CSR initiatives should go beyond minimum legal compliance.

Corrective actions. Actions intended to correct or counteract something that is malfunctioning, undesirable, or injurious. Corrective action is also sometimes used as an encompassing term that includes remedial actions, genuine corrective actions and preventive actions.

Corridor. Way to maintain vital ecological or environmental connectivity by maintaining physical linkages between core areas.

Corruption. The abuse of public power for private benefit; or, behaviour that deviates from the formal rules of conduct governing the actions of someone in a position of public authority because of private-regarding motives such as wealth, power, or status.

Cost Based approaches to valuation. A group of techniques for valuation that look at the market trade-offs or costs avoided of maintaining ecosystems for their goods and

services, including replacement costs, mitigative or avertive expenditures and damage costs avoided methods.

Cost-Benefit Analysis (CBA). A decision tool which judges the desirability of projects by comparing their costs and benefits.

CRISPR-Cas9 technology. Biochemical method using clustered regularly interspaced short palindromic repeats (CRISPR) guide RNA in conjunction with Cas9 (CRISPR-associated 9) nuclease to efficiently cut and edit DNA (Redford et al., 2019).

Critically Endangered. When used in the context of the IUCN Red List, a taxon is classified as 'Critically Endangered' when there is an extremely high risk of extinction in the wild in the immediate future (IUCN, 2001).

Critical natural capital. Describes the part of the natural capital that is irreplaceable for the functioning of the ecosystem, and hence for the provision of its services.

Cronyism. Partiality to long-standing, loyal friends.

Crowding out. When government expenditures or actions result in a decline of similar private sector spending or actions.

Cryptic. Fish species (or other organisms) that live amongst concealing or sheltering cover, or that possess protective colouration.

Crystals. A homogeneous solid with naturally formed plane faces. Minerals may present crystals of various sizes and geometric shapes (Crofts et al., 2020).

Crystalline rocks. Old term referring to rocks comprising crystals formed by slow cooling after being subject to intense heat and/or pressure. They can be either *metamorphic rocks*, such as *gneiss*, or *igneous rocks*, such as *granite* (Crofts et al., 2020).

Cultural and spiritual significance of nature. The inspirational, spiritual, cultural, aesthetic, historic and social meanings, knowledge, values, feelings, ideas and associations that natural features and nature in general reveal to and inspire in people – both individuals and groups. These attributes of nature range from species of flora and fauna to natural features to entire landscapes and waterscapes. They can encompass diverse manifestations such as night skies, monumental features, intimate local sites, as well as the practices, knowledge, human relationships and institutions associated with them (Verschuuren et al., 2021).

Cultural heritage. Cultural heritage is the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations (UNESCO, 1972).

Cultural landscapes. Those areas which clearly represent or reflect the patterns of settlement or use of the landscape over a long time, as well as the evolution of cultural values, norms and attitudes toward the land (Verschuuren et al., 2021).

Cuttings. The fragments of rock dislodged by the drilling bit and brought to the surface in the drilling mud.

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D

Decentralization. The transfer of authority and responsibility for public functions from the central government to the subordinate government and/or private sector. It includes political, administrative, fiscal and market dimensions.

Deciduous forest. Forest dominated by broad-leaved trees, e.g. beech, maple, oak, etc.

Decision analysis. A decision tool that judges the desirability of projects by weighting the expected values of a given course of action (in other words, the sum of possible values weighted by their probability of occurring) by attitudes to risk, to give expected utilities

Decomposer. An organism that feeds on dead organisms from all levels of the food chain, causing mechanical and chemical breakdown of the organisms and returning nutrients to the environment.

De-extinction (or species revival). The development of functional proxies for species which have previously become extinct (Redford et al., 2019).

Deforestation. Destruction of the forests to the extent that their natural reproduction becomes impossible.

Degraded. Reduction or loss of biological or economic productivity of the land.

Delta. Mouth of a river flowing out of several branches of which shape recalls a triangle (which is also the shape of the Greek letter delta).

Demersal. Occurring or living near or on the bottom of the ocean (*cf.* **pelagic**).

Democracy. Government by the people. Power is exercised directly or indirectly through a system of representation and delegated authority which is periodically renewed.

Demography. The statistical description of the size and composition of populations.

Deposition. (a) The dropping of particles due to gravity that were being carried by water, ice or wind; (b) precipitation of a mineral from a solution (Crofts et al., 2020).

Desertification. According to the UN Convention to Combat Desertification (UNCCD), desertification means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities (as agreed at the 1992 Earth Summit in Rio de Janeiro, Brazil).

Desert pavement. Topmost layer of angular stones covering desert surfaces; the dust falling on these stones is washed beneath the surface.

Desert varnish. A thin dark surface patina formed by a combination of leaching out of iron and manganese from underlying rocks and dust, and the action of lichens and bacteria.

Desiccation. A drying phenomenon; operation by which some elements are deprived of the moisture they contain.

Detritus. Decomposing organic material.

Development rights. Legal rights to use, develop or profit from land or resources owned by another, generally synonymous with usufruct rights.

Devolution. The act by which the government transfers core powers, rights and duties to individuals or groups of individuals that are located within or outside of the government.

Devonian. See *Geological timescale*.

Dewatering. Lowering of the water table.

Diatom. A unicellular algae consisting of two interlocking silica valves (NOAA, 2005).

Diel cycles. Cycles of activity occurring over a 24-hour period.

Digital sequence information on genetic Resources. Contested term referring to certain types of genetic information derived from DNA sequencing (Redford et al., 2019).

Direct-use value. A component of Total Economic Value: environmental and natural resources that are used directly as raw materials and physical products for production, consumption and sale.

DNA. Deoxyribonucleic acid.

DNA sequencing. Detecting the sequence of the four bases (adenine, thymine, guanine, cytosine) as the code of genetic information (Redford et al., 2019).

DNA synthesis. Process of creating natural or artificial DNA molecules (Redford et al., 2019).

Disaster. A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources (ISDR 2004).

Disaster Risk Reduction. People and institutions involved in preparedness, mitigation (e.g. reinforcing building structures, improving public awareness about disaster risks), and prevention activities (e.g. planting trees to stabilize riverbanks) associated with extreme events. These include hazard forecasting and immediate relief efforts for major disasters resulting from floods, cyclones and, in some cases, pollution events (adapted from IISD/IUCN/SEI 2003).

Disaster Response Planning. Adequate disaster preparedness requires a response plan which includes, e.g., contingency planning for prevention, as much as possible, and minimization of the adverse effects on people that can occur by release of hazardous, dangerous, and toxic chemicals/materials that can be accidentally released during a natural disaster (Christich pers. comm).

Discard/release mortality. The proportion of fish that die as a result of being discarded once captured. Discard mortality is often hard to assess as individuals returned to the sea alive may later die due to the effects of being caught.

Discards. The component of a catch returned to the sea, either dead or alive. Primarily made up of the **bycatch** but can include juveniles and damaged or unsuitable individuals of the target species.

Discount rate. The interest rate used to determine the present value of a future stream of costs and benefits.

Discounting. The process of finding the present value of a future stream of benefits, using a discount rate. The present value is obtained by multiplying the future cost or benefit by the expression, where i is the discount rate and n is the year in question.

Disturbance event. An event that causes a change in environmental conditions that interfere with ecosystem function.

Dispersal. The condition of individuals or seeds moving from one site to a breeding or growing site (Hilty et al., 2020). *Juvenile dispersal* means the process during which juveniles leave their native area and settle elsewhere.

Dissolution. Dissolving of minerals and rocks in natural waters (Crofts et al., 2020).

Diurnal temperature range. This is the difference between the daily maximum and minimum temperatures, which has been observed to be decreasing globally, especially in Australia.

Doline. An enclosed depression of moderate dimensions (<1km wide or deep) that is the fundamental unit of relief in many *karst terrains* and serves a similar hydrological function to a catchment. The term 'sinkhole' is commonly used as a synonym for a doline (Crofts et al., 2020).

Domestication. According to FAO, "Domestication is the process by which plants, animals or microbes selected from the wild adapt to a special habitat created for them by humans, bringing a wild species under human management". In a genetic context, the "process in which changes in gene frequencies and performance arise from a new set of selection pressures exerted on a population".

Dorsal. On the upper side of the body, opposite to **ventral**.

Dorsal fin. A fin located on the trunk or precaudal tail or both, and between the head and caudal fin. Most sharks have two dorsal fins, some batoids have one or none.

Draining. Artificial or natural evacuation (through a flow system) of water from a previously marshy area.

Drilling mud. Specialised fluid made up of a mixture of clay, water and chemicals, which is pumped down a well during drilling operations to lubricate the system, remove cuttings and control pressure.

Driver (direct or indirect). Any natural or human-induced factor that directly or indirectly causes a change in an ecosystem.

Dropline fishing. A method of deepwater fishing using a vertical line bearing rows of baited hooks.

Drought. The naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems.

Drumming. The display of the male ruffed grouse.

Drylands. Tropical and temperate areas with an aridity index of less than 0.65. Drylands can be classified into four types based on the aridity index: dry sub-humid, semi-arid, arid, and hyper-arid lands. According to this definition, drylands are not defined according to the level of precipitation.

Dry sub-humid land. Dry sub-humid land is the portion of land with an Aridity Index of 0.50–0.65. Dry sub-humid lands include woodland savannah and dry forests. See “drylands”

Dynamic landforms. Landforms constantly evolving or on the move, such as sand dunes in deserts and along sea coasts, or features such as sand and gravel bars in river beds, and unstable surface materials of soil and rocks on steep mountain slopes (Crofts et al., 2020).

Dynamite fishing. A destructive fishing method using explosives to kill and collect fish. Often used around coral reefs, causing habitat destruction.

Dystrophic. Rich in organic matter, but low in nutrient content and unproductive.

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E

Ecological connectivity. The unimpeded movement of species and the flow of natural process that sustain life on Earth (CMS, 2020)

Ecological connectivity for species (scientific-detailed definition). The movement of populations, individuals, genes, gametes and propagules between populations, communities and ecosystems, as well as that of non-living material from one location to another (Hilty et al., 2020).

Ecological corridor. A clearly defined geographical space that is governed and managed over the long term to maintain or restore effective ecological connectivity. The following terms are often used similarly: 'linkages', 'safe passages', 'ecological connectivity areas', 'ecological connectivity zones', and 'permeability areas' (Hilty et al., 2020).

Ecological diversity. Variety of ecosystems on any geographic level.

Ecological evaluation. To determine the value of something, for example, the value of the natural functions supplied to society by an ecosystem.

Ecological footprint. The area of direct environmental impact of an industrial operation on the land.

Ecological indicator. A measurable entity related to a specific ecological information need, such as the status of a population, a change in a threat or progress toward an ecological objective (Hilty & Merenlender, 2000).

Ecological infrastructure. A concept referring to both services by natural ecosystems (e.g. storm protection by mangroves and coral reefs or water purification by water and wetlands), and to nature within man-made ecosystems (e.g. microclimate regulation by urban parks).

Ecological integrity. Maintaining the diversity and quality of ecosystems and enhancing their capacity to adapt to change and provide for the needs of future generations.

Ecological legislation. Environmental policy instrument, which purpose is to regulate or promote the use of the soil and productive activities towards the protection of the environment, the sustainable conservation and exploitation of the natural resources, through the analysis of deterioration trends and exploitation potential.

Ecological memory. After catastrophic change, remnants (memory) of the former system become growth points for renewal and reorganisation of the social-ecological system. Ecological memory is conferred by biological legacies that persist after disturbance, including mobile species and propagules that colonise and reorganise disturbed sites and refuges that support such legacies and mobile links (Adger et al., 2005).

Ecological network (for conservation). A system of core habitats (protected areas, OECMs and other intact natural areas), connected by ecological corridors, which is established, restored as needed and maintained to conserve biological diversity in systems that have been fragmented (Bennett & Mulongoy, 2006).

Ecological niche. The functional role of an organism within a natural community.

Ecological phase shift. The shift of an ecosystem from one state of equilibrium to another due to disturbance (Nyström et al., 2001).

Ecological regulation. The environmental policy instrument which purpose is to regulate or induce the use of the soil and the productive activities to protect the environment, the sustainable preservation and exploitation of the natural resources through the analysis of deterioration trends and exploitation potentials.

Ecological resilience. The ability of a system to absorb or recover from disturbance and change, while maintaining its functions and services (adapted from Carpenter et al, 2001).

Ecological resistance. The ability of an ecosystem to withstand disturbance without undergoing a phase shift or losing neither structure nor function (Odum, 1989).

Ecological state of equilibrium. The state in which the action of multiple forces produces a steady balance, resulting in no change over time (NOAA, 2005).

Ecological steppingstone. Area of suitable habitat or habitat undergoing restoration between two protected areas or other important habitat types that provides temporary habitat for migratory birds and other species.

Ecomorphs. Species populations which have morphologically adapted to the environment.

Economic analysis. Examines the effects of projects, programmes and policies on costs and benefits to society as a whole, valued according to economic or shadow prices.

Economic Rate of Return. A measure of project desirability or profitability: the Internal Rate of Return of the flow of net benefits to a project when all costs and benefits are valued at economic or Shadow Prices.

Economic/monetary valuation. Assigning an economic value to environmental factors and considerations. This helps give weight to such considerations where they might otherwise not be taken into account. Full valuation requires significant information, time and resources. Valuation methodologies may be based on actual markets, surrogate markets or non-market techniques.

Economic values. Values measured at their “real” cost or benefit to the economy, usually omitting transfer payments and valuing all items at their opportunity cost to society.

Ecoregion. A geographical area presenting similarities and links to particular ecology and culture which defines a coherent entity.

Ecosystem. A dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit. It is the sum total of all the abiotic and biotic processes going on in an ecosystem that transfer energy and matter within and between ecosystems (e.g. biogeochemical cycles, primary production, etc.) (CBD, Art. 2, 1992).

Ecosystem approach. A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

Ecosystem-based adaptation. The use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change.

Ecosystem-based management (EBM). A process that integrates biological, social and economic factors into a comprehensive strategy aimed at protecting and enhancing sustainability, diversity and productivity of natural resources. EBM emphasizes the protection of ecosystem structure, functioning and key processes; is place-based in focusing on a specific ecosystem and the range of activities affecting it; explicitly accounts for the interconnectedness among systems, such as between air, land and sea; and integrates ecological, social, economic and institutional perspectives, recognizing their strong interdependences (COMPASS Scientific Consensus Statement).

Ecosystem benefits. Ecosystems provide benefits to communities that have economic value, including protection, food security, shelter and income.

Ecosystem function. The process through which the constituent living and nonliving elements of ecosystems change and interact (ForestERA, 2005).

Ecosystem functioning. The collective life activities of plants, animals and microbes and the effects these activities – feeding, growing, moving, excreting waste, etc. – have on the physical and chemical conditions of the environment (Crofts et al., 2020).

Ecosystem integrity. The continuity and full character of a complex system, including its ability to perform all the essential functions throughout its geographic setting; the integrity concept within a managed system implies maintaining key components and processes throughout time.

Ecosystem resilience. Ecosystems suffer natural disturbances (strong winds, fires) that affect their structure and operation, to which they respond through the recolonization of vegetable species in the affected areas. The recovery time is directly dependent upon the intensity and extension of the disturbance. The ecosystems' capacity to approximately return to the state prevailing prior to the disturbance is called resilience.

Ecosystem restoration. Recovery of the structure, function and processes of the original ecosystem.

Ecosystem services. The benefits people obtain from ecosystems. These include provisioning services such as food and water production; regulating services such as flood and disease control; cultural services such as spiritual, recreational and cultural benefits; and supporting services such as nutrient cycling that maintain the conditions for life on Earth (Millennium Ecosystem Assessment, 2005).

Ecosystem structure. The biophysical architecture of an ecosystem; the composition and arrangement of all the living and non-living physical matter at a location (Crofts et al., 2020).

Ecotourism. A form of tourism focused on the discovery of cultural and natural heritage and committed to respecting the environment while contributing to the well-being of local people.

Edge effects. A change in species composition, physical conditions or ecological factors at the boundary between a protected area and a non-protected area. The degree of these changes will vary depending on the size of the protected area.

Ediacaran period. See *Geological timescales*.

Effect on Production valuation methods. A Production Function Approach technique for valuing ecosystems or environmental resources that quantifies the relationship between changes in the quality or quantity of a particular ecosystem good or service with changes in market value of production.

Efficiency. The utilization in the best possible way of the complete package of potential or available resources.

Egg case. A stiff-walled elongate-oval, rounded rectangular, conical, or dart-shaped capsule that surrounds the eggs of oviparous sharks and is deposited by the maternal adult on the substrate.

El Niño Southern Oscillation (ENSO). El Niño Southern Oscillation (ENSO) refers to widespread 2-7 year oscillations in atmospheric pressure, ocean temperatures and rainfall associated with El Niño (the warming of the oceans in the equatorial eastern and central Pacific) and its opposite, La Niña. Over much of Australia, La Niña brings above average rain, and El Niño brings drought. A common measure of ENSO is the Southern Oscillation Index (SOI) which is the normalised mean sea level pressure difference between Tahiti and Darwin. The SOI is positive during La Niña events and negative during El Niño events.

Embezzlement. The deliberate fraudulent appropriation or theft of resources by those put to administer it.

Emigration. Change of regular residence from a political-administrative unit to another, at a given time, considered from the place where the movement originates.

Enabling framework. The mix of policies, institutions, social norms and collective agreements that can be used singly or in combination, by government, business and other stakeholders, to promote biodiversity business and other socially-beneficial activities. The enabling framework may include both voluntary incentives and mandatory requirements.

Enactment. Act of officially publishing a law leading to compliance and enforcement.

Endangered. When used in the context of the IUCN Red List, a taxon is classified as 'Endangered' when there is very high risk of extinction in the wild in the immediate future (IUCN, 2001).

Endemic. Native to, and restricted to, a particular geographical region. Highly endemic species, those with very restricted natural ranges, are especially vulnerable to extinction if their natural habitat is eliminated or significantly disturbed.

Endolithic algae. Algae that burrow into calcareous rocks or corals (NOAA, 2005).

Endowment fund. A financial portfolio that is managed to preserve and / or grow capital, while providing current income from investments.

Enrichment planting. The planting of desired tree species in a modified natural forest or secondary forest or woodland with the objective of creating a high forest dominated by desirable (ie local and/or high-value) species.

Environment. It refers to all living and non-living components and all the factors, like the climate, that surround an organism. It is frequently confused with the word ecology, which is the science that studies the relations of living beings with each other as well as with all the non-living parts of an environment. The environment could be conceived as a row of domino tiles. In this sense, ecology would be the study of the effect on each other of all the domino tiles while falling.

Environmental defender. Environmental defenders is used in this report as a synonym for “environmental human rights defenders”, defined as “individuals and groups who, in their personal or professional capacity and in a peaceful manner, strive to protect and promote human rights relating to the environment, including water, air, land, flora and fauna (IUCN, 2021).

Environmental externality. An activity by one agent that causes a loss/gain to the welfare of another agent and the loss/gain is uncompensated.

Environmental impact. The measurable effect of human action over a certain ecosystem. A measuring instrument is the manifestation of environmental impact, through which document is revealed the significant and potential environmental impact generated by an activity or work, as well as how it could be avoided or mitigated in the case of a negative impact.

Environmental Impact Assessment (EIA). An analytical process undertaken prior to decisions being taken on development projects, in an effort to avoid unforeseen adverse consequences. The process involves identifying, predicting, evaluating and mitigating the natural, social and other relevant environmental effects of development proposals (Crofts et al., 2020).

Environmental indicator. It is a parameter or value derived from general parameters that describes in a synthesized manner the pressures, condition, responses and/or trends of environmental and socio-environmental ecological phenomena, which meaning is broader than the properties directly associated to the parameter's value.

Environmental Management System (EMS). The system of organizational capacity, plans, procedures, resources, policies and standards used by energy and other companies to manage their environmental programs.

Environmental protection. Any activity that maintains the balance of the environment by preventing contamination and the deterioration of the natural resources, including activities such as: a) changes in the characteristics of goods and services, and changes in consumption patterns; b) changes in production techniques; c) waste treatment or disposal in separate environmental protection facilities; d) recycling; e) prevention of landscape degradation.

Environmental services. These services describe qualitative (even spatial) functions provided by the natural resources. Three types of environmental services usually exist: a) deposit services, which reflect the functions of the natural household environment as an absorbent dump of the waste originated by household productive activities and industrial activities in general; b) productive, with respect to water, land and air resources, which reflect the economic and ecological functions for human

consumption, energy, and agricultural purposes, etc.); c) recreational and socialization services, covering the basic functions of the environment to meet the recreation and socialization needs as well as the cosmology of certain societies.

Environmental valuation. Estimate about the magnitude or quality of the natural environment (air, water, soil) or investigation about the effects that a certain function or activity has on another function or activity.

Epibenthic. The area just above and including the seabed; epibenthic species live on or near the bottom.

Epiflora and epifauna. Plants and animals living on or just above the seabed.

Epipelagic. The upper part of the **oceanic** zone beyond the continental and insular shelves, from the surface to about 200m.

Epithermal activity. Shallow-depth activity that is low in temperature and pressure, resulting in formation of mineral veins and ore deposits (Crofts et al., 2020).

Equal opportunities. It is the situation where men and women have equal opportunities to become intellectually, physically and emotionally fulfilled, to pursue and achieve the goals they set in life, and develop their potential abilities, regardless of gender, class, sex, age, religion and ethnic group.

Equal treatment. It presupposes the right to equal social conditions of safety, remuneration and work conditions for women and men alike.

Equality. The condition of one thing being similar to another in terms of nature, form, quality and quantity. The achievement of the equality objective goes beyond the mere prohibition or elimination of discriminations.

Equitable benefits. It refers to the ultimate impact of development efforts on both genders. It implies that the results should be equally accessed and utilized by men and women. Equality of opportunities does not, necessarily, imply that both genders enjoy the same benefits.

Equity. It seeks people's access to equal opportunities and the development of basic capacities; this means that the barriers hindering economic and political opportunities, as well as the access to education and basic services, should be eliminated, so that the people (women and men of all ages, conditions and positions) may be able to enjoy such opportunities and benefit from them. It means justice; that is, giving each one what is rightfully theirs, recognizing the specific conditions or characteristics of each person or human group (sex, gender, class, religion, age); it is the recognition of diversity, without giving reason to discrimination.

Equity investment. Refers to the acquisition of equity (ownership) participation in a private or publicly-listed company.

Equivalent CO₂ concentration (carbon dioxide). The concentration of carbon dioxide that would cause the same amount of radiative forcing as a given mixture of carbon dioxide and other greenhouse gases.

Eradication. The complete removal *of all living representatives* of a species that is becoming (or is likely to become) invasive in a specified area or country.

Ericaceous shrubs. Shrubs of the heath *Ericaceae* plant family, e.g. heather, bilberry, rhododendron.

Erosion. The wearing away of the land surface by natural forces, such as water, ice or wind (Crofts et al., 2020).

Establishment. A phase (between *introduction* and *naturalisation*) in the (gradual) settling of a species in a new area such that it is able to reproduce without human assistance.

Estuary. Semi-enclosed body of water on the marine coastline, which presents the influence of marine waters, continental fresh waters (originating from rivers, creeks, etc.) and rain waters.

Ethnic groups. It refers to the classification of the population according to its social and cultural organization, which conforms particular ways of life for the members of a group. In general terms, the people who are part of an ethnic group share characteristics such as race, language, territory and above all, their view and interpretation of the world. Each ethnic group defines particular ways of life for women and men, thus determining the specificity of the condition and position of women.

Euryhaline. Species capable of occurring in fresh, brackish and saltwater.

Eustatic. Worldwide change in sea level such as that caused by tectonic movements or by the growth or decay of glaciers.

Eutrophication. The natural process of nutrient enrichment of a water body which is enhanced by phosphate and nitrate waste from human activity. It can cause excessive organic growth and depletion of oxygen concentrations, resulting in the death of aquatic animals and higher plants.

Evaporite rocks. See *Rocks*.

Evapotranspiration. The sum of water loss from both plants and soil measured over a specific area.

Evergreen plant. A plant that has leaves in all seasons.

Exclusive Economic Zone (EEZ). A zone under national jurisdiction (up to 200 nautical miles wide) declared in line with the provisions of 1982 United Nations Convention on the Law of the Sea (**UNCLOS**), within which the coastal State has the right to explore and exploit and the responsibility to conserve and manage, the living and non-living resources.

Existence value. The value that individuals place on knowing that a resource exists, even if they never use that resource (also sometimes known as conservation value or passive use value).

Exposure. A site or place where rock or softer sediments are visible at the surface. Also known as *Outcrop* (Crofts et al., 2020).

Exposure sites. Geological features that are spatially extensive below ground level actively renewed by erosion or, so that if one site or exposure is lost, another could potentially be excavated nearby. They include exposures in active and disused

quarries, coastal and river cliffs, road and rail cuttings, and natural rock outcrops (Crofts et al., 2020).

Ex situ. Outside the historical range of a species taxon.

Extent of occurrence. The area contained within the shortest continuous boundary which encompasses all known, inferred and projected sites of present occurrence of a **taxon**, excluding cases of vagrancy. This measure may exclude discontinuities or disjunctions within the overall distributions of taxa (e.g. large areas of obviously unsuitable habitat). See also **area of occupancy**.

Externality. The positive or negative consequence of an economic activity that is experienced by unrelated third parties, that is not reflected in the price of the goods or services being produced and for which no compensation is paid or received.

Extinction. An irreversible process whereby a species or distinct biological population forever ceases to exist. *In a geological context:* an event in the distant past when substantial numbers of existing species disappeared due to natural causes.

Extremophiles. Species that can withstand extreme conditions, such as darkness in caves or very high temperatures associated with volcanic activity (Crofts et al., 2020).

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F

Facilitator. An independent third party who guides the way a group identifies and solves problems and makes decisions to increase the group's effectiveness. The facilitator should be acceptable to all members of the group. A facilitator has no decision making authority.

Falcate. Sickle-shaped (e.g. a falcate **dorsal fin**).

Fallowing. According to FAO, "Fallowing is a process where sites normally used for production are left to recover for part or all of a growing season".

Family. Taxonomic category used in the classification of living beings in order to group one or several similar genders that are supposed to be closely related. Normally, the characteristics used to designate the families are easily observable.

Fauna. The community of animals peculiar to a region, area, specified environment or period.

Favouritism. Showing an inclination to favour some person or group, which in its most damaging form, constitutes unfair treatment of a person or group on the basis of prejudice.

Feasibility studies. A preliminary study undertaken to ascertain the likelihood of a project's success, generally including assessments of technical and financial viability.

Fecundity. The potential reproductive capacity and productiveness of an organism or population (NOAA, 2005).

Fetch. The distance along open water or land over which the wind blows; the distance traversed by waves without obstruction.

Fiduciary contract. A reciprocal relationship of accountability between citizens and the state in which services are provided by the state in exchange for financial contributions from citizens.

Filter-feeding. A form of feeding whereby suspended food particles are extracted from the water using gill rakers.

Filiform. Slender and elongate, filamentous, thread-like.

Financial analysis. Examines the effects of projects, programmes and policies on costs and benefits to the private returns accruing to a particular individual or group, valued according to financial prices.

Financial Rate of Return. A measure of project desirability or profitability: the Internal Rate of Return of the flow of net benefits to a project when all costs and benefits are valued at constant market prices.

Financial values. Values measured at market prices, as outflows or inflows to a particular individual or group.

Finite sites. Features of limited extent that will be depleted and damaged if any of the resource is removed or lost. Examples include geological sites with fossil-bearing rocks of limited extent or a mineral vein deposit (Crofts et al., 2020).

Finning. The practice of slicing off a shark's valuable fins and discarding the body at sea.

Fiscal. Relating to government taxation, spending, or financial matters.

Fiscal mechanisms. Financial tools used by the government to affect economic behaviour, for example taxes, subsidies or direct spending.

Fishery independent survey. An experimental or scientific survey of the **fauna** or catch within a fishery or area, conducted independently of the fishing industry.

Fishing. Capture, through the use of fishing gear or equipment, of live aquatic organisms that move with a certain speed.

Fishing effort. The amount of fishing taking place; usually described in terms of the gear type and the frequency or period which it is in use.

Fishing mortality. The proportion of fish that die due to fishing; often expressed as a percentage of the total **population** caught each year.

Flagship species. Popular charismatic species that serve as symbols to stimulate conservation awareness and action locally, nationally, regionally or globally.

Flaring. Controlled burning of surplus combustible gases in the atmosphere.

Fluvial processes. Natural terrestrial processes based on water movement, usually in rivers (Crofts et al., 2020).

Flyway. The entire range of a migratory bird species, distinct populations of a species, or groups of related species through which individuals move on an annual, seasonal or multi-year basis from breeding grounds to non-breeding areas. The term also includes intermediate resting and feeding places, as well as the areas within which the birds migrate (Boere & Stroud, 2006).

Flock. A group of birds feeding or moving together.

Forest area. Land under natural or planted stands of trees of at least 5 meters in situ, whether productive or not, and excludes tree stands in agricultural production systems (for example, in fruit plantations and agroforestry systems) and trees in urban parks and gardens (IUCN, 2021).

Forest cover. All the trees and other woody plants (scrub) covering the soil of a forest. It includes: trees and all types of bushes; bushes and weeds growing under or on forest clearings or thickets; humus or fallen leaves, branches, fallen trees, and other plant materials partially rotten on the surface and the upper soil layer.

Forest fallow. The intermediate time between two periods of shifting agriculture. In a functional shifting agricultural system, the fallow period is long enough that a functional secondary forest stand can develop (i.e. >20 years).

Forest integrity. The composition, dynamics, functions and structural attributes of a natural forest.

Forest management/manager. The people responsible for the operational management of the forest resource and of the enterprise, as well as the management system and structure, and the planning and field operations.

Formal engagement. An arrangement which includes some form of written agreement.

Fossil. An organic trace or remain of former living matter buried by natural processes and subsequently permanently preserved in rocks (Crofts et al., 2020).

Founder population. This refers to the number of founders that are introduced to establish a new population. Founders should be unrelated wherever possible.

Fragmentation. The breaking up of a habitat, ecosystem or land-use type into smaller and, often, more isolated parcels, thereby reducing the number of species that can be supported (Hilty et al., 2020).

Framework. A high-level structure which lays down a common purpose and direction for plans and programmes.

Fresh water. Term applied to water, which salinity is below 0.5 ppm.

Fugitive emissions. Unintended releases of gases, for example during the development of oil wells.

Fugitive (Mosses). Ephemeral species with high reproductive effort and small spores, occurring preferentially in habitats that occur unpredictably and are suitable for a very short time only.

Fumaroles. A hot spring in a volcanic area emitting very hot water, steam and noxious gases (Crofts et al., 2020).

Functional diversity. The range of functions that are performed by organisms in a system (Gray, 1997).

Functional genomic screening. A key discovery enabling the identification of gene and protein function (Redford et al., 2019).

Functional group. Groups of species with similar ecological roles/functions (Peterson, 1997).

Functions of the ecosystems. The capacity of the natural processes and components to supply goods and services that will be utilized or are being used to improve the human quality of life.

Fusiform. Spindle-shaped; narrow (more than three times as long as wide) and tapered at both ends.

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G

Galliformes. Birds of the chicken family; e.g. grouse, pheasants, partridges.

Gangue. Rock surrounding a mineral or precious gem in its natural state.

Garrigue. An open, shrubby, evergreen Mediterranean vegetation, usually occurring on calcareous soils, resulting from forest regression due to fire and intensive grazing.

Gastropod. Mollusc with a large fleshy foot that allows it to move.

Generalist predator. Carnivorous species feeding on a wide range of prey.

Genetically modified organisms. Biological organisms which have been induced by various means to consist of genetic structural changes.

Gender. Genders are bio-socio-cultural groups, historically built from the identification of sexual characteristics that classify human beings. Once classified, they are assigned a differentiated set of functions, activities, social relations, forms and standards of behavior. It is a complex set of economic, social, legal, political and psychological determinations and characteristics, that is, cultural, creating that which in each period of time, society or culture constitutes the specific contents of being a man or a woman.

Gender analysis. Is a theoretical-practical process that allows a differentiated analysis between men and women of the responsibilities, knowledge, access, use and control over the resources, the problems and needs, priorities and opportunities, in order to plan development based on efficiency and equity. Gender analysis does, necessarily, involve studying the forms of organization and operation of societies to analyze social relations. This analysis should describe the subordination structures existing between genders. The gender analysis should not be limited to the role of women, but should cover and compare the role of women with respect to men, and vice versa.

Genebank. Facility established for the *ex-situ* conservation of seeds, tissues or reproductive cells of animals or plants.

Gene drive. A phenomenon of biased inheritance in which the ability of a genetic element to pass from a parent to its offspring through sexual reproduction is enhanced, leading to the preferential increase of a specific genotype that may determine a specific phenotype from one generation to the next, and potentially throughout a population. A gene drive element is a heritable element that can induce gene drive, such that the gene drive element is preferentially inherited. Gene drive elements may be referred to as gene drive systems or simply “gene drives.” (Redford et al., 2019)

Gene flow. Exchange of genetic material between populations, either through individuals, or mediated through pollen, spores, seeds or other gametes (Redford et al., 2019).

Generation. Measured as the average age of parents of newborn individuals within the population. Where generation length varies under threat, the more natural, i.e. pre-disturbance, generation length should be used for **Red List** assessments.

Genes. Elements in all living things that carry hereditary characteristics, which, when expressed, make each individual different from all others.

Genetic diversity. Variety of genes or sub-specific genetic varieties.

Genetic drift. Random change of genetic variation from one generation to another.

Genetic engineering. Modification of the genetic structure of living organisms using molecular biology techniques that can transfer genes between dissimilar organisms.

Genetic rescue. Deliberate introduction of individuals or gametes as vehicles for the infusion of novel alleles (hence to increase gene flow, genetic diversity and fitness) (Redford et al., 2019).

Genetic resources. The genetic material with real or potential value.

Genetic stump. Is the base of the coded genetic information of organisms.

Genetically modified organisms (GMO). Also known as “living modified organism” (LMO), an organism whose characteristics have been changed by genetic engineering (contrasting classical selection experiments or naturally by mating and/or recombination) (Redford et al., 2019).

Genome editing. Making targeted changes to the genome of an organism, predominantly by using site-specific endonucleases such as CRISPR-Cas9 (Redford et al., 2019).

Genotype. The genetic constitution of an individual or group (NOAA, 2005).

Genus (plural: genera). One of the taxonomic groups of organisms, containing related **species**; related genera are grouped into **families**.

Geoconservation. The conservation and management of geoheritage (Crofts et al., 2020).

Geodiversity. The diversity of minerals, rocks (whether “solid” or “drift”), fossils, landforms, sediments and soils, together with the natural processes that constitute the topography, landscape and the underlying structure of the Earth.

Geodiversity Action Plan. A plan that defines clear long-term aims and objectives, and sets out measurable short-term targets and actions, to conserve and enhance the geodiversity and geoheritage of a particular area. It also identifies staffing and financial resources necessary to achieve them. These plans can also assist the integration of geodiversity and geoheritage into the conservation management of different categories of protected area (Crofts et al., 2020).

Geographic Information System (GIS). An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information.

Geoheritage. Those elements, features and processes of geodiversity, either singly or in combination, that are considered to have significant value for intrinsic, scientific, educational, cultural, spiritual, aesthetic, ecological or ecosystem reasons and therefore deserve conservation. Geoheritage constitutes a legacy from the past to be

maintained in the present and passed on for the benefit of future generations. Geoheritage records the cumulative story of the Earth preserved in its rocks and landforms, as in the pages of a book. It is represented in special places (see **Geosite**) and objects (geological specimens *in situ* and *ex situ* in museum collections) that are fundamental to our appreciation of the history of the Earth and the evolution of life (Crofts et al., 2020).

Geological timescale. A system of chronological dating of geological strata (*stratigraphy*). It is used by Earth scientists to describe the timing and relationships of events in the history of the Earth, measured in millions and multiples of millions of years (© International Commission of Stratigraphy, March 2020 version reproduced with permission) (Crofts et al., 2020).

Geomorphology. The study of the landforms and processes on and immediately below the surface of the Earth (Crofts et al., 2020).

Geomonitoring (or Site condition monitoring). Monitoring of particular features and processes to ascertain the state of health of the component interests at a geosite or for a whole system (Crofts et al., 2020).

Geopark. A generic term ascribed by a nation or region to an area with outstanding geological heritage aimed at both conservation and promoting its use in a sustainable way. Most Geoparks are not protected areas but they may contain protected areas. See also *UNESCO Global Geopark* (Crofts et al., 2020).

Geoscience. The study of the Earth's evolution and the current status of its abiotic aspects. The term comprises *geology*, *geomorphology*, geophysics, hydrology and physical geography (Crofts et al., 2020).

Geosite. Any site that has a single or a variety of geological or geomorphological features or processes worthy of protection on account of its scientific value. This is short-hand for terms such as 'geological sites' or 'geomorphological sites' (Crofts et al., 2020).

Geotourism. Sustainable tourism based on the geological and geomorphological features and processes of an area. These range in scale from a specific site, such as a tourist cave, through to extensive areas with spectacular scenery (Crofts et al., 2020).

Gestation period. The period between conception and birth in live-bearing animals.

Geyser. The ejection of superheated water and steam from underground sources in active or recently active volcanic regions (Crofts et al., 2020).

Gill. The spore-bearing, radiating structures found underneath certain mushroom caps.

Gillnet. A type of fishing net designed to entangle or ensnare fish.

Glabrous. Having no hair or similar growth.

Glaciation. A period of cold climate resulting in widespread expansion of ice sheets and mountain glaciers. Ice ages include intensely cold episodes (glacials) and alternate with warmer periods (interglacials) when there is a reduction of ice cover (Crofts et al., 2020).

Glacier. Snow compressed to form a solid of ice that moves with gravity. It takes various forms. *Ice caps and ice sheets* are extensive sheets of ice covering large areas such as Antarctica and Greenland, and can occur on a smaller scale as in Iceland and Svalbard. *Valley glaciers* fill pre-existing valleys and often enlarge them by steepening the sides, as in the Andes and the European Alps for example (Crofts et al., 2020).

Global fertility rate. Average number of children delivered by a woman throughout her reproductive life, in accordance with the fertility rates by age considered over a certain period of time.

Global temperature. Usually referring to the surface temperature, this is an area-weighted average of temperatures recorded at ground- and sea-surface-based observation sites around the globe, supplemented by satellite-based or model based records in remote regions.

Global warming. An increase in global average surface temperature due to natural or anthropogenic climate change.

Gneiss. A metamorphic rock whose formation is caused by intense heat and pressure on pre-existing rocks (Crofts et al., 2020).

Gobbling. Typical vocalisations of displaying male lesser prairie chickens and sharp-tailed grouse.

Gobbling ground. A name for the display ground of the lesser prairie chicken. Also: booming ground.

Governance. The exercise of political authority and the use of institutional resources to manage society's problems and affairs.

Governance authority. The institution, agency, individual, Indigenous Peoples or community group, or other body acknowledged as having authority and responsibility for decision making over an area, and whose authority may include management of an area (IUCN WCPA, 2019; Borrini-Feyerabend et al., 2013). It is to be recognised that there may be multiple governance authorities, both formal and informal.

Governed. The condition in which an area is under the authority of a specified entity or entities conducting the actions, policy and affairs of the area. Ecological corridors can be governed under the same range of governance types as protected areas (Hilty et al., 2020).

Granite. A coarse grained igneous rock formed below the Earth's surface after the slow cooling of magma, forming minerals of which quartz and feldspar are dominants (Crofts et al., 2020).

Grasslands. Grasslands are regions dominated by grasses, legumes and other forbs, and at times woody species (e.g. acacia savannah). Grasslands include natural and semi-natural ecosystems, as well as modified ecosystems devoted to the production of introduced forage. Grasslands include North America prairie, Asian steppe, African savannah, South America pampa and cerrado, and many other types of habitat.

Greenhouse gasses. Gasses that contribute to the greenhouse effect, i.e. hinder heat radiation from escaping through the atmosphere.

Green militarisation. Green militarisation is “The use of military and paramilitary personnel, training, technologies, and partnerships in the pursuit of conservation efforts”. In other words, green militarisation refers to conflict resulting from efforts to maintain nature (IUCN, 2021).

Gross Domestic Product (GDP). The sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (IUCN, 2021).

Gross Domestic Product (GDP) per capita. Gross domestic product divided by midyear population (IUCN, 2021).

Groundwater. Water stored in and flowing through rocks and sediments below the ground surface supplied by water infiltrating from the surface or through concentrated sources such as a sinking stream. During periods with no rainfall, surface waters are fed by groundwater (Crofts et al., 2020).

Group felling. A silvicultural system that removes mature timber in small groups at relatively short intervals, repeated indefinitely, where the continual establishment of regeneration is encouraged and an uneven-aged stand is maintained.

GSSP (Global Boundary Stratotype Section and Point). A standard unit used in the identification of type sections and reference points to define the boundaries of the stages in the geological timescale according to internationally agreed standards. The International Commission on Stratigraphy, a commission of the International Union of Geological Sciences (IUGS), is working to reach international agreement on the definition of global standard units. The site where a GSSP is identified and approved is marked by a symbolic Golden Spike (Crofts et al., 2020).

Gunpoint conservation. Conservation carried out by means of armed coercion. In other words, gunpoint conservation refers to efforts to conserve nature resulting from conflict (IUCN, 2021).

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H

Habitat. The place or type of site where an organism or population naturally occurs (CBD, Art. 2, 1992).

Habitat degradation. A decline in habitat quality for a species, e.g. related to changes in food availability, cover, or climate.

Habitat fragmentation. The process and result of breaking an area of contiguous habitat into distinct patches.

Habitat loss. An area that has become totally unsuitable for a species.

Habitat management. Management activities involving vegetation, soil and other physiographic elements or characteristics in specific areas, with specific conservation, maintenance, improvement or restoration goals.

Habitat specialist. A species that tends to show relatively narrow habitat preferences and therefore is susceptible to habitat change.

Haline. Term used to indicate the prevalence of oceanic salts.

'Hard' engineering. The use of heaving engineering methods and techniques that ignore in part or whole the natural processes operating on a site or area and therefore create an unnatural situation (cf. *'soft' engineering*) (Crofts et al., 2020).

Harvest. Product obtained or harvested through a growing or breeding process.

Hazard. A potentially damaging physical event, phenomenon or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation (ISDR, 2004).

Heat Shock Protein. Proteins present in the cells of all living organisms. They are induced when a cell is exposed to certain environmental stresses. Heat shock proteins are also present in cells under normal conditions, assisting in other cellular protein functions and behaviour (NOAA, 2005).

Hemisphere. Half of a globe; may be either eastern and western, or northern and southern hemisphere.

Herbivore. A plant eater.

Heterodontoid. A bullhead shark, horn shark, or Port Jackson shark, a member of the **order** Heterodontiformes, **family** Heterodontidae.

Heterotroph. An organism that cannot make its own food, and which eats other organisms or complex organic substances that are produced by other organisms.

Hexanchoid. A cowshark or frilled shark, members of the **order** Hexanchiformes and including the sixgill sharks, sevengill sharks and frilled sharks.

High forest. Generic term used to describe a forest close to its successional climax – most commonly synonymous with 'primary forest', but can also be achieved in a managed natural forest under a strict selection system.

High tide. The highest level reached by the sea at the culmination of the high tide flow.

Highly migratory fish stocks. As defined under **UNFSA**, highly migratory fish stocks are those that generally roam over large distances and may be found in numerous **EEZ** jurisdictions and the high seas.

Hitchhiker. A biological specimen that is carried into a new ecosystem, without the knowledge of the person involved. ‘Hitchhikers’ usually are carried by or in another species, or in vessels, vehicles, shipping materials or otherwise.

Holocene. An epoch of the Quaternary period dating from the end of the Pleistocene approximately 10,000 years ago until the present (NOAA, 2005).

Holotype. A single specimen cited in the original description of a species which becomes the ‘name-bearer’ of the species. The holotype is used to validate the species and its accompanying **scientific name** by anchoring it to a single specimen.

Hooting. Typical vocalisations of displaying male blue grouse.

Human disturbance. Presence of humans, e.g. recreationists in wildlife habitats, and the individual responses and population-level effects caused by man-wildlife encounters.

Human settlements. The establishment of a given demographic conglomerate, along with its set of living-related systems in a physically located area. Natural elements and infrastructure are considered within the area.

Human well-being. Concept prominently used in the Millennium Ecosystem Assessment—it describes elements largely agreed to constitute ‘a good life’, including basic material goods, freedom and choice, health and bodily well-being, good social relations, security, peace of mind, and spiritual experience.

Humus. The partially decomposed remains of dead plant and animal tissues.

Hybridization. Cross-breeding between individuals of different species.

Hydrocarbons. Organic compounds of hydrogen and carbon whose densities, boiling points and freezing points increase as their molecular weights increase. Although composed of only two elements, hydrocarbons exist in a variety of compounds, because of the strong affinity of the carbon atom for other atoms and for itself. Petroleum is a mixture of many different hydrocarbons.

Hydrology. The study of the movement of water from the sea through the air to the land and back to the sea; the properties, distribution, and circulation of water on or below the Earth’s surface and in the atmosphere.

Hydrological changes. Changes in the speed and power of water flows in channels and over the ground surface causing changes in the distribution of unconsolidated materials downstream (Crofts et al., 2020).

Hydrothermal phenomena. Those occurring where geothermal activity reaches the ground surface in the form of superheated water and steam. They interact with

volcanic materials to form features such as hot springs, *geysers*, mud pools and *fumaroles* (Crofts et al., 2020).

Hydrophytes. Plants growing in the water or a substratum that periodically lacks oxygen as a result of excessive amounts of water. For example, the mangrove.

Hydrosphere. All of the Earth's water, including oceans, lakes, streams, underground water snow and ice.

Hygrophytic. Marsh plants existing in moist habitats, though not in habitats inundated by water.

Hyper-arid land. Hyper-arid land is the portion of land with an Aridity Index of less than 0.05. Many hyper arid lands are known colloquially as deserts. They support sparse but uniquely adapted biodiversity. See *Drylands*.

Hypersaline. Term used to characterize the waters with a salinity above 40 ppm, derived from salts from inner land.

Hypoxic. Low in O₂.

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I

Ichthyofauna. Fish.

Igneous rocks (or Magmatic rocks). See *Rocks*.

Illegal logging. Contravention of national or international law at any point along the trade chain from source to consumer.

Immersed plant. These are vascular or non-vascular, rooted or non-rooted, absorbent plants, totally immersed in the water, with the exception of the blooming portion of some species.

Immunostimulants. These are molecules that have stimulatory effects on non-specific immune defences of humans and animals. These compounds are attractive for use in intensive fish and animal farming: to improve the health of the organisms and prevent disease outbreak, thereby reducing the use of antibiotics and veterinary medicines.

Impact mitigation. Measures and actions taken to avoid, minimise, reduce, remedy and / or compensate for the adverse impacts of development. In general, a hierarchy of 'avoid – reduce – remedy – compensate' is used to establish an order of preference (beginning with avoid) for mitigation measures.

Inbreeding depression. The loss of individual reproductive fitness, and thus population vigour and long-term viability, due to breeding between closely related individuals compared to less related individuals.

Incentives (disincentives), economic. A material reward (or punishment) in return for acting in a particular way which is beneficial (or harmful) to a set goal.

Incidental catch. See *Bycatch*.

Incubation. The hatching of eggs by means of heat (natural or artificial).

Indicator species. A species sensitive to environmental change, which can therefore provide a measure of health for the ecosystem.

Indigenous and community conserved areas (ICCAs). Natural and/or modified ecosystems, containing significant biodiversity values, ecological benefits and cultural values, voluntarily conserved by indigenous peoples and local communities, both sedentary and mobile, through customary laws or other effective means (Mitchell et al., 2018).

Indigenous lands and territories. The total environment of the lands, air, water, sea, sea-ice, flora and fauna, and other resources which indigenous peoples have traditionally owned or otherwise occupied or used.

Indigenous Peoples. "The existing descendants of the peoples who inhabited the present territory of a country wholly or partially at the time when persons of a different culture or ethnic origin arrived there from other parts of the world, overcame them and, by conquest, settlement, or other means reduced them to a non-dominant or colonial situation; who today live more in conformity with their particular social, economic and cultural customs and traditions than with the institutions of the country of which they now form a part, under State structure which incorporates mainly the

national, social and cultural characteristics of other segments of the population which are predominant.” (Working definition adopted by the UN Working Group on Indigenous Peoples).

Indirect-use value. The benefits derives from the goods and services provided by an ecosystem that are used indirectly by an economic agent. For example, the purification of drinking water filtered by soils.

Infant mortality rate. Number of deceased infants under one year of age per one thousand births, usually over a one-year period.

Infauna. Animals that live within the sediment.

Infiltration. The process by which water enters and moves downwards through the soil (Crofts et al., 2020).

Inflorescence. A group or cluster of flowers.

Infrastructure. The basic physical structures and services – both man-made and natural – that are needed for the functioning of a community or society.

Inlet. Tidal canal that communicates a coastal lagoon or the muddy and sandy swamps of the low coast plains, directly from the sea or from an estuary.

In-situ conservation. The conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

In-situ data. Data associated with reference to measurements made at the actual location of the object or material measured, by contrast with remotely-sensed data, i.e., from space (PODAAC, 2005).

Institutional analysis. Identifies how institutions influence buyers and sellers of watershed services, and changes needed for a payment scheme to succeed.

Institutional investor. An investor, such as a bank, insurance company, retirement fund, hedge fund, or mutual fund, that is financially sophisticated and makes large investments, often held in very large portfolios of investments.

Institutions. Institutions can refer, narrowly, to specific organizations – or, more broadly, to the policies, rules, incentives, customs and practices that govern social relations.

Integral management. Management activities involving biological, social, economic and cultural aspects linked to wildlife and its habitat.

Intergrade. The adoption of intermediate characters or traits of adjacent subspecies.

Integrated Coastal Management (ICM). A broad and dynamic process that requires the active and sustained involvement of the interested public and many stakeholders with interests in how coastal resources are allocated and conflicts are mediated. ICM is multi-purpose oriented, it analyses and addresses implications of development, conflicting uses and interrelationships between physical processes and human

activities, and it promotes linkages and harmonization among sectoral coastal and ocean activities.

Integrity sites. Geomorphological sites that include both static (inactive) features, such as Pleistocene glacial landforms, and active features, such as those formed by river, coastal, karst and contemporary glacial processes (Crofts et al., 2020).

Intensive culture. “Intensive culture is a system of culture characterised by a production of up to 200 tonnes/ha/yr; a high degree of control; high initial costs, high-level technology, and high production efficiency; tendency towards increased independence of local climate and water quality; and the use of man-made culture systems” (FAO).

Intensive management. Management activities involving wild species or populations under conditions of captivity or confinement.

Interdorsal ridge. A low narrow ridge of skin on the midline of the back between the dorsal fin bases in sharks with two dorsal fins, particularly important in identifying grey sharks (**genus** *Carcharhinus*, **family** Carcharhinidae).

Intergovernmental Panel on Climate Change (IPCC). The Intergovernmental Panel on Climate Change, set up in 1988 by the World Meteorological Organisation and the United Nations Environment Program to advise governments on the latest science of climate change, its impacts and possible adaptation and mitigation. It involves panels of climate and other relevant experts who write relevant reviews, which are then critically reviewed by many other researchers and governments from member countries around the world. Summaries for Policymakers are adopted in a plenary session of government delegates, typically from over 100 member countries including developed and developing countries. See www.unep.ch/ipcc.

Internal Rate of Return (IRR). A measure of project desirability or profitability: the discount rate at which a project's Net Present Value becomes zero.

International Council for the Exploration of the Sea (ICES). The organisation that coordinates and promotes marine research in the North Atlantic.

Intertidal zone. Extension of the coastline delimited by the level of the high tide and the level of the low tide.

Intrinsic rate of increase. A value that quantifies how much a **population** can increase between successive time periods; plays an important role in evaluating the sustainability of different harvest levels and the capacity to recover after depletion.

Introduction. Introduction of an organism is the intentional or accidental dispersal by human agency of a living organism outside its historically known native range (IUCN, 1987).

Invasion. Species invasion or biological invasion is the action of an invasive species as its population increases in size and spread and begins to have negative impacts on the ecosystem it has entered.

Invasive Alien Species. Taxa that are introduced accidentally or deliberately into a natural environment where they are not normally found, with serious negative consequences for their new environment (Redford et al., 2019).

Invertebrates. Animals without a backbone, such as insects, snails and worms.

Investment bank. This type of bank provides a range of financial and investment related services, advising clients on security issues, acquisitions and disposals of businesses, arranging and underwriting new issues, distributing securities and running fund management companies.

Irradiance. The amount of radiation (usually referred to as light).

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J

Joint venture. A group of companies that share the cost and rewards of exploring for and producing oil or gas from a concession.

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K

Karst. Suites of landforms, commonly including sinking streams, blind and dry valleys, closed depressions (termed *dolines* and larger flat-floored *poljes*), caves, formed largely as a product of *dissolution* acting on rocks that have a high solubility in natural waters (Crofts et al., 2020).

Key Biodiversity Areas. Sites contributing significantly to the global persistence of biodiversity (IUCN, 2021).

Keystone species. A species that plays a large or critical role in supporting the integrity of its ecological community.

Knowledge management. The set of disciplined and systematic actions that an organisation takes to derive the greatest value from the knowledge it acquires, creates, stores, shares and uses.

Koonkie. The term describes a trained domestic Asian elephant (also spelt **Kunkie**).

Krummholz. Literally: bended wood. Low-growing trees and bushes in the subalpine zone of mountainous areas with bended shapes e.g. some species of alder and pine.

K-selected species. A species selected for its superiority in a stable environment; a species typified by slow growth, relatively large size, low natural mortality and low fecundity (*cf.* **r-selected species**).

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L

L max. Maximum length recorded for a particular fish.

Labelling. Labelling involves attaching a piece of paper or other material to a product to provide consumers with information about the object to which it is attached.

Lacuna. Air canals (through which gasses can diffuse between different parts of a seagrass plant).

Lacustrine. Pertaining or relative to the lakes.

Lagoon. A warm, shallow, quiet water body separated from the sea by a reef crest (NOAA, 2005).

Lahar. Mudflow or debris flow composed of a slurry of *pyroclastic* material, rocky debris and water caused by a volcanic eruption. The material flows down from a volcano, typically along a river valley (Crofts et al., 2020).

Lamnoid. A mackerel shark, a member of the **order** Lamniformes and including the sand tiger sharks, goblin sharks, crocodile sharks, megamouth shark, thresher sharks, basking shark and the makos, porbeagle, salmon shark and white shark.

Lampenflora. Algae, mosses and vascular plants that grow in artificial light in tourist caves (Crofts et al., 2020).

Lanceolate. Leaf or leaflet which is spear-shaped; a narrow leaf broader at the base and tapering to a point.

Land cover. The physical coverage of land, usually expressed in terms of vegetation cover or lack of it. The human use of a piece of land for a certain purpose (such as irrigated agriculture or recreation) influences land cover.

Land Degradation. According to the UNCCD "land degradation" means reduction or loss of the biological or economic productivity and complexity of land. Land degradation can result from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as soil erosion, deterioration of the physical, chemical and biological or economic properties of soil, and long-term loss of natural vegetation.

Land Degradation Neutrality. The UNCCD defines Land Degradation Neutrality, or LDN, as a "state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems". In simple terms LDN is a balance between all actions that degrade land and all actions that sustainably manage, protect or restore land. Land Degradation Neutrality (LDN) is central to Target 15.3 of the Sustainable Development Goals. It has been adopted as a primary target of the United Nations Convention to Combat Desertification.

Landforms. Surface or underground features formed by a particular natural process, such as a glacial moraine or a sand dune or a cave (Crofts et al., 2020).

Landscape. A geographical mosaic composed of interacting ecosystems resulting from the influence of geological, topographical, soil, climatic, biotic and human interactions in a given area.

Landscape scale. A wide-area conservation approach over a whole landscape, as opposed to that at the site level (Crofts et al., 2020).

Large footprint industries. Industries whose core business has a significant negative environmental impact on biodiversity conservation.

Large Marine Ecosystem (LME). Large Marine Ecosystems are regions of ocean space encompassing coastal areas from river basins and estuaries to the seaward boundaries of continental shelves and the outer margins of the major current systems (IUCN/NOAA).

Larvae. A sexually immature juvenile stage of an animal's life cycle (NOAA, 2005).

Lava. Molten material flowing over the ground and into water from a volcano or vent in the Earth's surface. It solidifies on cooling into different shapes, such as described by the Hawai'ian terms aa (a bloc ky shape) and pahoehoe (a ropy shape) (Crofts et al., 2020).

Lax. Loose; referring to both large thin-walled cells, and the nature and spacing of leaves on the plant stem. Also refers to the nature and spacing of leaves on the stems of plants in a tuft.

Leaching. Slow passage of a solvent through a layer of porous or crushed material in order to extract valuable components; for example, gold can be extracted by heap leaching a porous ore or pulverised tailings.

Leaf axil. The point at which the leaf stem is attached to a stem or branch.

Leakage. The situation in which a carbon sequestration activity (e.g., tree planting) on one piece of land inadvertently, directly or indirectly, triggers an activity, which in whole or part, counteracts the carbon effects of the initial activity.

Leaseholds. Contracts which permit tenants to benefit from the land for a specified period of time, usually for rent.

Lentic. Body of continental waters that are stagnant, settled, or have very little movement.

Lenticels. The breathing pores in the outer bark of woody plants.

Leptobenthic. Elongated bottom sharks. Applied to the chondrichthyan **ecomorphotype** *Leptobenthic*, elongated bottom sharks of the continental and insular shelves.

Lianas. Climbing plants found in tropical forests with long, woody, rope-like stems.

Licensing. A commercial operation where in exchange for a fee, permission is given for use of name, logo or copyright for commercial purposes.

Lichen. Close association between a photosynthetic algae (which produces its food through solar energy) and a fungus that settles on rocky surfaces.

Life expectancy. The average number of years a person may expect to live under unchanged mortality trends. It is commonly stated as life expectancy at birth.

Life history strategy. The significant features of the life cycle through which an organism passes, with particular reference to strategies influencing survival and reproduction (USGS, 2005).

Lifecycle (industrial). The entire sequence of activity relating to an industrial operation, from beginning to end.

Light. That part of the electromagnetic spectrum that supports vision and photosynthesis. See also *Irradiance*.

Light absorption. Matter converts light energy to internal heat or chemical energy, thus dissipating it (Petzold, 1972).

Light attenuation. The decrease in light (e.g. along a depth gradient).

Light scattering. The direction of travel of light photons is changed so that they are dispersed and the light energy is decreased, although the wave length stays the same (Petzold, 1972).

Limestone. A *sedimentary rock* composed mainly of calcite and/or dolomite formed by the precipitation of non-organic material and accumulation of organic material in marine or, less frequently, freshwater environments. Tufa and travertine are examples of freshwater limestones. (Crofts et al., 2020)

Limited entry fishery. A management arrangement to control the amount of **fishing effort** in a fishery where the number of operators (and size of vessels) is restricted through licence limitation or quota systems.

Limnetic. All the deep sea habitats.

Limnic. The biological, physical, and chemical aspects of lakes, ponds, and streams.

Linear. Shape of leaf or leaflet which is long and narrow, almost parallel-sided.

Linf (L8). L infinity, the theoretical mean size a fish would reach if it could grow indefinitely.

Littoral zone. The intertidal zone of the shore.

Live-bearing. A mode of reproduction in which female sharks give birth to young sharks, which are miniatures of the adults. See *Viviparity*.

Livelihoods. Livelihoods comprise the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capacities and assets both now and in the future, while not undermining the natural resource base.

Living nature. Can be used as a synonym for “biological diversity” or “biodiversity”, defined as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (IUCN, 2021).

Lixiviant. Chemical used for *in-situ* leaching of minerals such as uranium and copper. It may be acidic, basic or neutral and may contain oxidants.

Load capacity. An ecosystem’s estimated tolerance to the use of its components. This tolerance should be such so as to keep it from exceeding its capacity for short-term recovery, without the application of restoration or recovery measures to restore ecological balance.

Loan guarantees. A legal obligation to compensate a lender if the borrower fails to repay a loan. This reduces the risk of lending, allowing the borrower to receive funds on more favourable terms. Loan guarantees can be structured to cover all or a percentage of the credit provided (typically only the principal), and to be drawn upon under varying circumstances (typically only after standard debt collection practices have been exhausted).

Local community. A human group sharing a territory and involved in different but related aspects of livelihoods such as managing natural resources, producing knowledge and culture, and developing productive technologies and practices. Since this definition can apply to a range of community sizes, it can be further specified that the members of a ‘local community’ are those who are likely to have face-to-face encounters and/or direct mutual influences in their daily lives. In this sense, a rural village, a clan or the inhabitants of an urban neighbourhood can be considered a ‘local community’, but not all the inhabitants of a district, a city quarter or even a rural town. A ‘local community’ could be permanently settled or mobile (Borrini-Feyerabend et al., 2004).

Local extinction. When there is no doubt that the last individual of a particular species has died from a defined region or area.

Local Geodiversity Action Plans (LGAPs). Plans that set out a framework, guiding principles and priorities to ensure conservation of geoh heritage and the networks of geosites at a regional or local scale (Crofts et al., 2020).

Local laws. Includes all legal norms given by organisms of government whose jurisdiction is less than the national level, such as departmental, municipal and customary norms.

Loess. A sedimentary deposit of fine-grained, yellowish earth rich in calcium carbonate.

Longevity. The maximum expected age, on average, for a species or **population** in the absence of human-induced or **fishing mortality**.

Longline fishing. A fishing method using short lines bearing hooks attached at regular intervals to a longer main line. Longlines can be laid on the bottom (**demersal**) or suspended (**pelagic**) horizontally at a predetermined depth with the assistance of surface floats. May be as long as 150km with several thousand hooks.

Longwall mining. Underground mining where entries and crosscuts are created around a large block which is eventually mined out resulting in subsidence of the ground surface.

Lothic. Systems of waters in movement.

Low tide. Lowest level reached by the sea at the end of the ebb tide.

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M

Macroalgae. Multicellular algae large enough to be seen by the human eye (NOAA, 2005).

Macrophyte. Macroscopic plants immersed in water, visible at a glance. The opposite of this term are the microscopic plants, such as some types of algae, which cannot be observed at a glance.

Macroplastics. Large plastic waste readily visible and with dimensions larger than 5 mm, typically plastic packaging, plastic infrastructure or fishing nets (Boucher & Friot, 2018).

Magma chamber. A cauldron of molten rock below the Earth's surface containing materials that may reach the surface as molten materials, solids, or gases (Crofts et al., 2020).

Mainstreaming. Gender mainstreaming means that continuous attention should be paid to equality between men and women in development policies, strategies and development interventions. Gender mainstreaming does not only mean ascertaining the participation of women in a previously established development program. It also aims at guaranteeing the participation of men and women in the definition of objectives and planning stages, so as to make certain that development meets the needs and priorities of women and men alike. Therefore, equality should be considered with respect to the analysis, policies, planning processes and institutional practices which determine the global conditions for development.

Managed. In the context of an ecological corridor, the condition of taking active steps to conserve or restore the natural (and possibly other) values to ensure functionality. Note that 'managed' can include decisions not to intervene in an area (Hilty et al., 2020).

Management effectiveness. How well a protected area is being managed – primarily the extent to which it is protecting values and achieving goals and objectives.

Managed realignment. A technique, usually applied to soft coasts of sands and other unconsolidated material, where the sea is allowed to penetrate further inshore through the removal of human-made structures, such as walls or embankments, and enabling the formation of saltmarshes that absorb wave energy. It is used to reinstate the coast to a more natural regime (Crofts et al., 2020).

Mangrove. Tree, shrub, palm or ground fern, generally exceeding more than half a meter in height, and which normally grows above mean sea level in the intertidal zones of marine coastal environments, or estuarine margins. The term "mangrove" can refer to either the constituent plants of tropical intertidal forest communities or to the community itself.

Marginal benefit. The change in benefit associated with consuming one additional unit of a good or service.

Marginal cost. The change in cost associated with producing one additional unit of a good or service.

Marginal value. The change in value resulting from one more unit of a good or service produced or consumed.

Marine phanerogams (sea grasses and phanerogam prairies). Communities of vascular plants (usually called superior) found below the surface of shallow marine waters, generally on low energy or protected coasts. Their name derives from their grass-like appearance, although they are in no way related to the family of dry land grasses.

marine protected area (MPA). A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. MPAs can offer a spectrum of management strategies ranging from full protection, or no-entry areas, to multiple-use areas which prohibit limited activities. No-take MPAs are spatial closures that prohibit all forms of resource extraction, especially fishing. Limited take MPAs include those MPAs with mixed harvest or restricted harvest prohibition areas (IUCN-WCPA, 2008).

Market-based approach. An approach to providing goods and services, notably public services and environmental protection, which seeks to align market incentives with the public interest and thereby attract private entrepreneurs and investors. In the case of biodiversity conservation, market-based approaches include a range of legal measures and voluntary initiatives that seek to make it profitable to conserve biodiversity and to use biological resources sustainably.

Market price valuation methods. A technique for valuing ecosystems or environmental resources by using its market price: how much it costs to buy, or what it is worth to sell.

Marketing. The management process responsible for identifying, anticipating and satisfying customer requirements profitably.

Mass coral bleaching. Coral bleaching extending over large distances (often affecting reef systems spanning tens to hundreds of kilometres) as a result of anomalously high water temperatures.

Matrophagy. The subsistence of developing embryos on eggs, smaller embryos or uterine fluids.

Maximum Sustainable Yield (MSY). The largest average catch or yield that can continuously be taken from a fish stock under existing environmental conditions (NOAA).

Mediator. A mediator is an impartial neutral third party who facilitates negotiations between the parties in an informal setting. The mediator helps the Parties to develop and reach a settlement in a voluntary process.

Megadiverse countries. Bolivia, Brazil, China, Colombia, Costa Rica, Ecuador, India, Indonesia, Kenya, Malaysia, México, Perú, the Philippines, South Africa and Venezuela. Three fourths of the world's flora and fauna species are found in this group of 15 countries. Some of the advantages of being included in the megadiverse group are: bearing influence on the definition of policies on biological diversity conservation, and being included among the international assistance agencies' countries that receive priority attention in connection with funding for natural resource conservation projects.

Mendelian inheritance. Form of inheritance proposed by Gregor Mendel with the following laws: law of segregation, law of independent assortment, law of dominance. Characteristics are inherited from parents to offspring individuals following those laws in predicted ratios (Redford et al., 2019).

Meristem. Growth area of leaves, roots and rhizomes; area of high cell division activity.

Mesh size. The size of openings in a fishing net. Limits are often set on mesh size to protect the young of target species, allowing them to reach maturity or optimal size for capture (minimum mesh size); or to protect larger breeding individuals (maximum mesh size).

Mesic. Moist.

Mesohaline. Term used to characterize waters with a salinity from 5 to 18 ppm, deriving from ocean salts.

Mesopelagic. The intermediate part of the **oceanic** zone from 200m to 1,000m depth.

Mesophyte. Plants growing where a combination of extreme dryness and extreme humidity prevails.

Metals. A material with a high reflectivity and conductivity that can usually be deformed plastically; also refers to metallic elements when these are combined with other elements to form non-metallic compounds such as salts and oxides.

Metamorphic rocks. See *Rocks*.

Metapopulation. A system of connected, spatially distinct subpopulations.

Mezzanine finance. Mezzanine finance is a hybrid between debt and equity, with many possible permutations in terms of how it is structured. Generally, this consists of debt that is convertible to shares / equity within a specified period, and / or based on certain conditions or performance benchmarks.

Microalga. Alga that is so small that it can only be seen using a microscope (as opposed to macroalga).

Micro-catchments. A watershed area usually used to describe a smaller part of a river basin draining into a tributary stream. Similar to sub-catchments.

Micro-organism. An organism that is too small to be seen with the naked eye.

Microsporine-like amino acids. UV-absorbing compounds found in coral tissues. Thought to be produced by zooxanthellae (NOAA, 2005).

Migration. The displacement that implies changing the usual place of residence from an administrative political unit to another, at any given time. **Assisted m--.** Human-aided, intentional dispersal of a species into an area where conditions are more favourable for its conservation.

Migration of species. The regular annual or seasonal movement of individual animals or populations of animals between distinct habitats, each of which is occupied during different parts of the year (Lindenmayer & Burgman, 2005).

Migratory species. The entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdiction boundaries (CMS, Art. 1, 1979).

Mill/concentrator processing plant. Surface plant facilities for ore treatment that allow for the recovery and removal of metals or the concentration of valuable minerals for smelting and refining.

Mineral. Inorganic substance with a characteristic chemical composition and an ordered arrangement of atoms, ions or molecules which occur by natural geological processes (Crofts et al., 2020).

Mineralogy. The study of minerals – their origin, form and constituents. (Crofts et al., 2020)

Mineralisation. The conversion of an element from an organic form to an inorganic state as a result of microbial decomposition.

Minimum Viable Population. The estimated minimum number of animals in a population needed for long-term survival (e.g. 100 years) with high probability (e.g. 95%).

Mire. Soil predominantly composed of mud and clay, fine mineral sediments less than 0,074 mm. in diameter.

Mitigation. Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards (ISDR, 2004).

Mitigative or avertive expenditure valuation methods. A Cost Based Approach technique for valuing ecosystems or environmental resources that assesses the value of ecosystem goods and services by calculating the cost to mitigate or avert economic losses resulting from their loss.

Mixohaline. Term used to characterize waters with a salinity from 0.5 to 30 ppm deriving from salts of an ocean origin.

Mixotrophic. Rich, but humus-influenced.

Modified natural forest. Primary forests managed or exploited for wood and/or non-wood forest products, wildlife and/or other purposes. The more intensive the use, the more the structure and composition is altered compared to that of primary forests. Ecologically, the alteration often represents a shift to an earlier successional stage. Two major categories can be distinguished: managed primary forest and degraded and secondary forests.

Mollusc. Soft-bodied invertebrate animal.

Monitoring. Regular, statistically designed counts of a population in order to watch its numbers, composition and distribution.

Monitoring & Evaluation (M&E). Monitoring focuses on tracking inputs, outputs, outcomes and impacts as interventions are implemented. Evaluation assesses the efficiency and impact of interventions (typically after they have been implemented). Together M&E allows policy-makers to track results, suggest corrections or improvements during implementation, and assess success.

Monoecious. Both female and male flowers occurring on the same plant (as opposed to dioecious).

Monogamy. Mating system with pair bonds; partners have only one mate.

Monophagous. Living on only one type of food.

Monotypic. With only one species.

Montane zone. The montaineous vegetation zone dominated by coniferous forest.

Mooring. An arrangement for securing a boat to a mooring buoy or a pier. Boats using moorings do not have to use traditional anchors, thus reducing damage to coral reefs (GBRMPA, 1996).

Moraines. Landforms at or near the margins of glaciers and ice sheets comprising unconsolidated sediments of all sizes, from clays to boulders. Terminal moraines occur at the front of a glacier, and lateral moraines at the sides (Crofts et al., 2020).

Morphology. The form and structure of organisms (NOAA, 2005).

Mortality gross rate. Number of deaths per one thousand inhabitants over a certain period of time, usually one year.

Mosses. These are non-blooming plants, without a vascular system or roots. They grow on the soil, rocks and tree bark. They live in humid and shady places, and are reproduced by spores.

Moveable geoheritage. Fossils, minerals, and rocks with exceptional value moved to an *ex situ* location, for instance in museum collections, to improve their protection (Crofts et al., 2020).

Mudflats. Coastal natural habitat composed of fine sediment being the habitat for some species that live on top of or in the mud (worms, shellfish, crabs, and waders).

Mulch till. Conservation tillage system where the soil is disturbed prior to planting.

Multicellular. Consisting of many cells.

Multi-criteria analysis. A decision tool that integrates and weights different types of monetary and non-monetary information, based on ecological, social and economic criteria: economic valuation of ecosystem goods and services can be incorporated as one of these criteria.

Multiple use areas. These are geographical areas established in PA, where the development of diverse activities and uses of natural resources is promoted and allowed, for the purpose of simultaneously achieving sustainable production and nature conservation.

Mycorrhiza. A mutually beneficial (symbiotic) association between a plant root and a fungus that enhances the ability of the root to absorb water and nutrients.

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N

Natural capital. An economic metaphor for the limited stocks of physical and biological resources found on earth, and of the limited capacity of ecosystems to provide ecosystem services. Natural resources, like water, air and soil.

Natural forest. Forest areas where many of the principal characteristics and key elements of native ecosystems such as complexity, structure and diversity are present, as defined by FSC approved national and regional standards of forest management.

Natural hazard. A natural process or phenomenon – such as a hurricane, earthquake or drought - that can potentially result in a loss of life, property damage, livelihoods and services, social and economic disruption, or environmental damage.

Natural mortality. The proportion of fish that die other than due to fishing, i.e. that proportion due to ageing, predation, cannibalism and disease; often expressed as a percentage of the total population dying each year.

Natural resources. Natural assets (raw materials) occurring in nature that can be used for economic production or consumption. They are often subdivided into four categories: mineral and energy resources, soil resources, water resources and biological resources. Another categorisation concerns renewable and non-renewable resources. Renewable natural resources are natural resources that can regenerate through natural processes, including living resources like forests or fish stocks, or non-living ones like water. Non-renewable natural resources such as mineral resources, are exhaustible and cannot be regenerated (IUCN, 2021).

Natural resource degradation. Natural resource degradation refers to any damaging or undesirable change or disturbance to natural resources, for example, deterioration of natural resources through depletion, destruction or external factors such as climate change (IUCN, 2021).

Natural resource governance. Natural resource governance refers to the norms, institutions and processes that determine how power and responsibilities over natural resources are exercised, how decisions are taken, and how citizens – women, men, indigenous peoples and local communities – participate in and benefit from the management of natural resources (IUCN, 2021).

Natural resource management

Natural resource management refers to the management of natural resources such as land (including agricultural land, forests, wetlands, grasslands and other types of land), water, soil, plants and animals (IUCN, 2021).

Naturalisation. The process by which an alien species becomes a (new) part of a local fauna or flora, reproduces and spreads without human assistance. See *Acclimatised species*.

Nature-based Solutions (NbS). Actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits (Crofts et al., 2020).

Nature-based tourism. Forms of tourism that use natural resources in a wild or undeveloped form. Nature-based tourism is travel for the purpose of enjoying undeveloped natural areas or wildlife (Leung et al., 2018).

Nature conservation. In this context nature always refers to biodiversity, at genetic, species and ecosystem level, and often also refers to geodiversity, landform and broader natural values. In the context of protected areas, conservation refers to the in-situ maintenance of ecosystems and natural and semi-natural habitats and of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties (Dudley, 2008).

Neighborhood. For marine species, neighborhood can be defined as the area centered on a set of parents that is large enough to retain most of the offspring of those parents (Palumbi, 2004).

Nektonic. Freely swimming in the pelagic zone, regardless of water motion or wind.

Neotype. A specimen, not part of the original type series for a species, which is designated by a subsequent author, particularly if the **holotype** or other types have been destroyed, were never designated in the original description, or are presently useless.

Nepotism. Favouring of relatives.

Neritic. That part of the oceans over the continental and insular shelves, from the intertidal to 200m.

Net present value (NPV). A measure of project desirability of profitability; the sum of discounted net benefits and costs of a project.

Neutral company/sector. One whose core business has no significant impact on biodiversity conservation.

No till. Conservation tillage system where soil is left undisturbed from harvest to planting except for nutrient injection.

Nomenclature. In biology, the application of distinctive names to groups of organisms.

Non-photochemical quenching (of photosynthesis). Dissipation of light energy that results in heat.

Non-point source pollution. Pollution from many diffuse sources, for example when runoff moves over and through the ground carrying natural and human-made pollutants into lakes, rivers, wetlands and coastal waters.

Non tidal. It refers to the water system that is not influenced by the ocean. It can be affected by the wind from the lakes and the water system; it is defined according to the various periods (dry, humid).

Non-Timber Forest Products (NTFPs). Natural products other than wood derived from forests or wooded land. Examples of NTFP include edible nuts, mushrooms, fruits, herbs, spices, honey, gums and resins, rattan, bamboo, thatch, cork,

ornamental plants and flowers, and an array of plant and animal products used for medicinal, cosmetic or cultural purposes.

Non-use values. Benefits which do not arise from direct or indirect use.

Normalized Difference Vegetation Index (NDVI). The NDVI is a dimensionless index that can be used to estimate the density of green on an area of land. Unhealthy or sparse vegetation reflects more visible light and less near-infrared light. Very low values of NDVI (0.1 and below) correspond to barren areas of rock, sand or snow. Moderate values represent shrub and grassland (0.2 to 0.3), while high values indicate temperate and tropical rainforests (0.6 to 0.8). NDVI has been shown to be highly correlated with photosynthetic capacity and net primary production. NDVI can be interpreted as an indicator of vegetation health (IUCN, 2021).

No-take zone. A Marine Protected Area that is completely (or seasonally) free of all extractive or non-extractive human uses that contribute impact (NOAA, 2005).

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O

Ocean acidification. The process whereby atmospheric carbon dioxide dissolves in seawater producing carbonic acid, which subsequently lowers pH of surrounding seawater (National Geographic); widely thought to be happening on a global scale.

Ocean fertilisation. A controversial method proposed for mitigating rising atmospheric CO₂ levels and associated climate change by stimulating net phytoplankton growth through the release of nutrients, such as iron, into certain parts of the surface ocean.

Oceanic. Living in the open ocean, mainly beyond the edge of the **continental shelf**.

Ocelli. Eye-like spots.

Old growth forest. Forest that resulted from natural succession without human influence.

Oligosaline. Term which characterizes the water with a salinity of 0.5% to 5%, derived from non-oceanic salts.

Oligotrophic. Nutrient-poor environment.

Omnivore. An animal that consumes both plants and animals.

Oophagy. A mode of **aplacental viviparity** employing uterine cannibalism, whereby early foetuses deplete their yolk sacs early, then subsist by feeding on eggs produced by the mother.

Open pit. A surface mine, such as a quarry, open to daylight; also referred to as open-cut or opencast mine.

Operator. The company that has the right to apply its own technical policies in conducting exploration and production programs in a concession on behalf of the other equity holders.

Opportunities. Are the possibilities to develop intellectual, physical and emotional abilities, to pursue and achieve the goals set in life.

Opportunity cost. Foregone benefits of not using land/ecosystems in a different way, e.g. the potential income from agriculture when conserving a forest.

Optimum yield (OY). The harvest level for a species that achieves the greatest overall benefits, including economic, social and biological considerations. This differs from **MSY** which only considers biology of the species.

Option value. A component of Total Economic Value: the premium placed on maintaining environmental or natural resources for future possible uses, over and above the direct or indirect value of these uses.

Order. One of the taxonomic groups of organisms, containing related **families**; related **orders** are grouped into classes.

Organic. Matter containing carbon-based compounds.

Organism. A life-form such as a plant, animal, fungus or bacteria.

OECM (Other effective area-based conservation measure). A geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity with associated ecosystem functions and services and, where applicable, cultural, spiritual, socio-economic and other locally relevant values are also conserved (IUCN-WCPA, 2019).

Oil rents (% of GDP). Oil rents are the difference between the value of crude oil production at world prices and the total costs of production. Oil rents (% of GDP) indicates how large oil rents are relative to Gross Domestic Product (IUCN, 2021).

Oolite. *Limestone* formed of ooliths; spherical particles grown by accretion around a nucleus in deep water (Crofts et al., 2020).

Other forest types. Forest areas that do not fit the criteria for plantation or natural forests and which are defined more specifically by FSC-approved national and regional standards of forest stewardship.

Outcrop. A place where rock is exposed at the surface and not covered with soil, vegetation or built structures (Crofts et al., 2020).

Overburden. The rock and soil cleared away before mining.

Overexploitation. The use or extraction of a resource to the point of exhaustion or extinction, or diminishing a population to a level below the minimum required for a sustainable performance.

Overland flow. The dispersed flow of water over the ground surface before it is concentrated in a channel (Crofts et al., 2020).

Oviparity. A reproductive mode where the maternal adult deposits eggs enclosed in **egg cases** on the sea floor which later hatch to produce young.

Oviphagous. Egg-eating, referring to developing embryos. See *Ovophagy* and *Oophagy*.

Ovophagy. A reproductive mode in which the developing embryos feed in the uterus upon eggs produced by the mother.

Ovoviviparous. Refers to a species of which eggs incubate and hatch in the belly of the mother but without being fed in by the mother (less developed strategy than that of the viviparous).

Oxidoreductase enzymes. Multiple enzymes (organic catalysts) that work together to quench harmful active oxygen (Lesser, 1997).

Oxygen radical. Highly reactive oxygen molecules that have lost an electron and thus stabilise themselves by 'stealing' an electron from a nearby molecule. Their high reactivity means they can cause cell damage (Houghton Mifflin, 2003).

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P

Paired fins. The **pectoral** and **pelvic fins**.

Palaeontology. The study of fossils of plants and animals providing knowledge about the origin and evolution of life on Earth and about ancient environments (Crofts et al., 2020).

Palaeozoic era. An era of geological time lasting from 543 to 248 million years ago (UCBMP, 2005).

Parapatric. Distribution of species that meet in a very narrow zone of overlap.

Para-species. Closely related species inhabiting adjacent, but non-overlapping areas.

Parent material. Source rock or sediment from which overlying material, especially soils, are derived (Crofts et al., 2020).

Park for Peace. A Park for Peace is a designation that may be applied to Transboundary Protected Areas, Transboundary Conservation Landscapes and/or Seascapes, and Transboundary Migration Conservation Areas, and “is dedicated to the promotion, celebration and/or commemoration of peace and cooperation” (IUCN, 2021).

Participation. Active involvement in decision-making of those with an interest in or affected by important decisions.

Particulate. A very small solid suspended in water (NOAA, 2005).

Pastoralism. IUCN defines pastoralism as extensive livestock production in rangelands. Many forms of pastoralism are characterised by organised livestock movements (e.g. herd mobility, transhumance), although not all forms of pastoralism involve mobility. The people who carry out pastoralism are known by many labels (pastoralists, shepherds, herders, ranchers, Bedouin, transhumant etc.). They may move their residence according to the movement of their herds, or they may be sedentary.

Pathogen. A biological agent that causes disease or illness to its host (Redford et al., 2019).

Pathways. Kinds of human action that result in (and/or enable) the introduction (intentional or unintentional) of an alien species to a new ecosystem, area or country.

Patronage. The act of supporting or favouring some person, group, or institution.

Payment schemes. Arrangements for payments between buyers and sellers of goods or services.

Payment for environmental services (PES). Market-based approaches using payments or rewards to encourage or discourage specific practices in natural resources management.

Peatland. Is constituted by flooded and soggy areas, with large accumulations of organic material, covered by a layer of poor vegetation associated with a certain degree of acidity, and which presents a characteristic amber colour.

Pectoral fins. In sharks, a symmetrical pair of fins on each side of the trunk, corresponding to the forelimbs of a land vertebrate.

Peduncle. Cord uniting two parts of organs (stalk). In the case of barnacles the peduncle is a kind of flexible foot that allows the organism to attach to rocks.

Pelagic. Occurring or living in open waters or near the surface with little contact with or dependency on the bottom (*cf.* demersal).

Pelvic fins. In sharks, a symmetrical pair of fins on the sides of the body between the abdomen and precaudal tail which correspond to the hindlimbs of a four-footed land vertebrate.

Perennial. Plants that persist for many growing seasons. Often the top portion of the plant dies back during winter or the dry season and regrows from the same root system, although many perennial plants keep their leaves year round.

Perennifolious forest. It is commonly called jungle. Unlike the caducifolious forest that means deciduous leaves, the perennifolious forest has trees with perennial or permanent leaves. It is found in altitudes ranging from 0 to 1000 meters above sea level.

Perfect competition. A market situation in which the number of buyers and sellers is very large, the products offered by sellers are indistinguishable, there are no restrictions on market entry, buyers and sellers have no advantage over each other, and everyone is fully informed about the price of goods. Under such conditions, no individual or company can affect the market price of a good or service by their action.

Periglacial. Describes the climate, natural processes and landforms in cold, non-glacial environments in mountain or polar regions. The main process is repeated freezing and thawing of the ground, resulting in the formation of ice-wedge polygons and patterned ground (sorted circles and stripes), the slow downslope movement of rock debris and the collapse of rock faces (Crofts et al., 2020).

Permafrost. Ground that is permanently frozen, occurring principally in the polar regions and on high mountains (Crofts et al., 2020).

Permanence. The longevity of a carbon pool and the stability of its stocks, given the management and disturbance environment in which it occurs.

Permian. See *Geological timescale*.

Perverse incentives. Incentives that undermine or lead to the opposite of the desired result.

Pest. Any species (or other related taxon such as subspecies, strain, biotype) of plant, animal or micro-organism (including pathogens) that is injurious to plants, animals and human activities.

Petrology. The study of all aspects of rocks, including mineral constituents, textures, structure and origins (Crofts et al., 2020).

Phenology. The study of the relationship between climate and the timing of periodic natural phenomena such as migration of birds, bud bursting, or flowering of plants.

Phenotype. The ensemble of observable characteristics displayed by an organism (Redford et al., 2019).

Philanthropy. Financial donations with minimal conditions attached.

Photoinhibition. Decreased photosynthetic rate because of too high irradiance.

Photosynthesis. The production of chemical compounds in the chlorophyll containing tissues of plants, in particular the formation of carbohydrates from the carbon in carbon dioxide and the hydrogen in water with the aid of sunlight, releasing oxygen in the process.

Photosynthetic pigment. A pigment that efficiently absorbs light within the 400-700 nm range and is essential for photosynthesis (NOAA, 2005).

Photosynthetically active radiation (PAR). That part of the electromagnetic spectrum that supports photosynthesis (400-700 nm).

Phytoplankton. Free floating plants that drift with the currents (usually of microscopic size).

Pirogue. Canoe, traditionally dugout, now also manufactured with other materials.

Piscivorous. Feeding on fish.

Placer. An alluvial deposit of sand and gravel containing valuable metals such as gold, tin, etc.

Placer mining. Mining sand and gravel deposits for their mineral content.

Plankton. Organism that drifts with the currents. See also *Phytoplankton* and *Zooplankton*.

Plastics. Commercially-used materials made from monomers and other raw materials chemically reacted to a macromolecular structure, the polymer, which forms the main structural component of the plastic (Elias, 2003).

Playas. Depression where rainwater can accumulate (also dry lake or pan). Usually flat with no vegetation; water can persist for several weeks after rainfall.

Plate tectonics. Unifying theory combining continental drift, sea-floor spreading, seismic and volcanic activity, and crustal structures. The Earth's blocks of rocks on land and under the sea are formed into eight major and several minor internally rigid plates that are in motion relative to each other. The term also refers to the study of their relative movements over time in the formation of continents and oceans. The margins of the individual plates take various forms; the most important for terrestrial geoconservation are where the plates are colliding or where they are moving apart. Examples of the former are the margins between the Pacific and North American

plates, the Pacific and the South American plates, the African and Eurasian plates, and the Indian and Eurasian plates, all of which have played a fundamental role in the evolution of major mountain systems and volcanic activity. In other places, the plates are separating; examples are best manifested on land in Iceland and under the sea along the Mid-Atlantic Ridge (Crofts et al., 2020).

Pleistocene. An interval of the Quaternary period, from 1.8 million years before present to 10,000 years before present (NOAA, 2005).

Pliocene. An interval of the late Neogene period, from 5.3 to 1.8 million years before present (NOAA, 2005).

Pneumatophores. Aerial roots of a mangrove that typically rises from the soil into the air above the low tide level, thereby allowing the plant to obtain oxygen directly from the air ("breathing roots").

Poaching. Illegal hunting.

Pod. A fruit, usually long, cylindrical and never fleshy, as in peas.

Point source pollution. Pollution released at specific identifiable sites, for example from factories or sewage outlets.

Polluter pays principle. The individual or company who is responsible for introducing or spreading invasive species should bear the costs of measures to prevent, eradicate, contain or manage that species and to mitigate and remediate the damage it gives rise to.

Pollution. The contamination of an ecosystem, especially with reference to human activities.

Polyculture. "Polyculture is the rearing of two or more non-competitive species in the same culture unit". There is no competition for food or habitat, but neither are there any trophic benefits due to the interaction (FAO).

Polymers. A group of organic, semi-organic, or inorganic chemical substances containing large polymer molecules. These molecules are formed by linking together small molecules, called monomers, by polymerizations processes (G: polys = many, meros = part). According to the International Union of Pure and Applied Chemistry (IUPAC) polymer and macromolecular substance are synonyms (Elias, 2003).

Polyp. An individual of a solitary cnidarian or one member of a cnidarian colony. Cnidarians are an animal phylum containing stony corals, anemones, sea fans, sea pens, hydroids and jellyfish (NOAA, 2005).

Ponds. According to FAO, "Ponds are a relatively shallow and usually small body of still water or with a low refreshment rate, most frequently artificially formed, but can also apply to a natural pool, tarn, mere or small lake".

Population. Set of individuals from the same wild species that share the same habitat. It is considered as the basic management unit of wild species living in freedom.

Population ageing. Modification of the population structure by age, which translates into a proportional increase in the number of old people and a decrease in the relative importance of children and youngsters.

Population dynamics. The development of population size over time.

Population study. Study about the local populations of a species, in order to appraise and assess the size and density of the population, its numbers by sex and age, birth, death and growth rates, as well as the number of individuals that may be serviceable during a certain period of time, without affecting the resource and its long-term productive potential.

Population's total growth. The total increase in population resulting from the interaction of births, deaths, and migration of a population, within a certain period of time.

Position. It refers to social positioning and recognition, to the status assigned to women with respect to men (inclusion in decision-making spaces at community level, equal wages for equal work, limitations about their access to education and training, for example). As it may be easily inferred, condition and position refer to practical and strategic needs and interests.

Post-consumer waste. People's rubbish.

Power. Dominion, authority or jurisdiction to command, define, control and decide about something or someone.

Power analysis. Relates the power of different stakeholders to their potential to control implementation or be affected by a payment scheme.

Prairie. Natural grassland areas (steppe) of North America.

Pre-Cambrian. See *Geological timescale*.

Precaudal fins. All fins anterior of the **caudal fin**.

Precautionary principle. A principle which states that lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental damage to habitats or species when there is a threat of serious or irreversible environmental degradation.

Precipitation. Water that falls from the atmosphere to the surface; may be in the form of rain, snow, hail or sleet.

Predictions. A prediction is a statement that something will happen in the future, based on known conditions at the time the prediction is made, and assumptions as to the physical or other processes that will lead to change. Because present conditions are often not known precisely, and the processes affecting the future are not perfectly understood, such predictions are seldom certain, and are often best expressed as probabilities. Daily weather forecasts are 'predictions' in this sense: they are predictions of what the weather will be like, but have uncertainties due to inexact observations and weather models. They are often expressed in probabilistic terms.

Preparedness. Specific measures taken before disasters strike, usually to forecast or warn against them, take precautions when they threaten and arrange for the

appropriate response (such as organising evacuation and stockpiling food supplies). Preparedness falls within the broader field of mitigation (Twigg, 2004).

Preservation. The set of policies and measures to maintain the conditions favoring the evolution and continuity of the ecosystems and natural habitats, as well as the conservation of viable populations of species in their natural environments and the components of biodiversity outside their natural habitats.

Prevention. The stoppage of an organism from entering a country, area or ecosystem because it has been deemed to be a potential pest, pathogen or invasive species.

Prevention measures. These include investing in ecosystems such as sand dunes, mangrove belts, coral reefs, wetlands and use of forested slopes as barriers.

Primary forest. Forest which has never been subject to human disturbance, or has been so little affected by hunting, gathering and tree-cutting that its natural structure, functions and dynamics have not undergone any changes that exceed the elastic capacity of the ecosystem.

Primary microplastics. Plastics that are directly released into the environment in the form of small particulates. They may be intentionally added to products such as scrubbing agents in toiletries and cosmetics (e.g. shower gels) or they may originate from the abrasion of large plastic objects during manufacturing, use or maintenance such as the erosion of tyres when driving or of the abrasion of synthetic textiles during washing (Boucher & Friot, 2017).

Private good. A good which, if consumed by one person, cannot be consumed by another. The benefits of a private good are both divisible and excludable.

Private payment schemes. PES schemes in which agreements are made between private entities to provide payments or rewards in return for maintenance or restoration of ecosystem services.

Produced water. Water from the natural oil reservoir which is separated from the oil and gas in the production facility.

Production. The phase of the petroleum industry that deals with bringing the well fluids to the surface and separating them, and with storing, gauging and otherwise preparing the product for the pipeline.

Production cycle. (*Aquaculture*). The time necessary to rear any aquaculture species to marketable size.

Production function approaches to valuation. A group of techniques for valuation that attempt to relate changes in the output of a marketed good or service to a measurable change in the quality or quantity of ecosystem goods and services through establishing a biophysical or dose-response relationship between ecosystem quality, the provision of particular services, and related production, including effect on production methods.

Production well. Also called development well. A well drilled specifically into a previously discovered and appraised field for the purpose of producing oil or gas.

Productive work. It comprises the activities that generate income, goods, services or benefits for household consumption or market commercialization, through which household reproduction is safeguarded. The social construction of genders assigns the productive work to the men. Fulfilment of their role as providers means to obtain the resources outside the private sphere of the household to support their family and meet their needs. In spite of the fact that the productive work is an activity socially assigned to men, the fact of the matter is that women, girls and boys also participate.

Productivity. Relates to the birth, growth and mortality rates of a fish **stock**. Highly productive **stocks** are characterised by high birth, growth and mortality rates and can usually sustain higher exploitation rates and, if depleted, could recover more rapidly than comparatively less productive **stocks**.

Program-related investments (PRIs). PRIs are typically provided by foundations, or similar organisations, that have endowments invested to produce funds that support annual grant making. Instead of investing all of the endowment funds in stocks, bonds and other instruments that have 'market rate' returns, a portion of these funds can be invested in initiatives that will yield below-market rate returns, but generate 'programmatic' benefits in keeping with the foundations' (charitable) principles.

Projection. Projections are sets of future conditions, or consequences, derived on the basis of explicit assumptions, such as scenarios. Even for a given scenario or set of assumptions, projections introduce further uncertainties due to the use of inexact rules or 'models' connecting the scenario conditions to the projected outcomes.

Propagule. Part of a plant that can detach and then form a new rooted plant.

Property rights. Legal ownership rights to land or resources.

PA (protected area). A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (Dudley, 2008; Stolton et al., 2013).

Proxy variable. In monitoring studies, a proxy variable is something that is probably not in itself of any great interest, but from which a variable of interest can be obtained. For examples, isotope ratios in coral skeletons are often used to determine environmental temperatures of the past. Wooldridge and Done (2004) used the highest 3-day summer SST's as a proxy variable for maximum heat stress for a site.

Public domain (maritime and terrestrial zones). Areas that are public property. They are managed by the state and in general are available for public use. The state determines the particular uses of each of these areas, and may offer concessions or authorizations to private or public organizations for exclusive uses.

Public good. A good whose benefits can be provided to all people at no more cost than that required to provide it for one person. The benefits of a public good are indivisible, and people cannot be excluded from enjoying them.

Public interest (social). Are the overall interests of the collectivity of citizens from a country. Said interests are established by law, and there are legal regulations protecting these interests to the benefit of the collectivity.

Public-owned assets (national). State-owned assets which direct use, or use by the population, is limited by law. They are inalienable assets (not subject to trading),

not subject to prescription (impossibility of acquiring ownership of a public asset through an act of prescription), and unattachable.

Public payment schemes. PES schemes in which government entities compel changes in environmental management through a variety of (fiscal) payment mechanisms including user fees, land purchases, taxes and subsidies.

Pyroclasts. Material blown into the atmosphere by volcanic activity, such as pumice, and ash, and eventually coming to rest on the Earth's surface (Crofts et al., 2020).

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Q

Quartz. A silica mineral in *igneous, metamorphic* and *sedimentary rocks*. It is one of the most commonly occurring minerals on Earth and also the major constituent of sand in deserts and along coasts (Crofts et al., 2020).

Quaternary. See *Geological timescale*.

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R

Race. A distinct variety within a species or subspecies.

Radical uncertainty. Describes situations where the range of potential consequences of an action is unknown, as opposed to the uncertainty about whether a known (possible) consequence will happen.

Radon. A naturally occurring radioactive gas that is inert, colourless and odourless produced by the decay of thorium and uranium minerals in certain rocks (Crofts et al., 2020).

Raise/Chute. Steeply inclined rectangular or cylindrical opening used for ventilation or for conveying ore, miners or equipment; the slope is generally 45 degrees, but varies up to 90 degrees.

Range. The amount of space needed by an animal in order to meet its survival needs.

Range shift. A change in the geographic coverage of a species as determined by environmental and bioclimatic factors.

Rangeland. There is no globally-agreed definition of rangelands and the term can be used either as an ecological or a social concept. Rangeland ecosystems have been defined from an ecological perspective as “land on which the indigenous vegetation (climax or sub-climax) is predominantly grasses, grass-like plants, forbs or shrubs that are grazed or have the potential to be grazed, and which is used as a natural ecosystem for the production of grazing livestock and wildlife” (Allen et al., 2011). This can include annual and perennial grasslands, shrub lands, dry woodlands, savannah, tundra, and desert. From a social perspective rangelands are a management unit, which may contain a great diversity of different ecosystem and areas suitable for other uses like cultivation. Some of these elements may not be classified as rangeland ecosystems; for example oases, wetlands, riparian forests, high altitude forests (e.g. mist or alpine forests) and so on. Yet these resources within rangeland landscapes are often critical—sometimes seasonally essential—to the functioning of the rangeland management units and the associated livelihoods.

Rebound potential. A measure of the ability of a **species** or **population** to recover from exploitation.

Recombination. In the process of transferring genetic information from parents to offspring, new combinations of traits can occur, caused by recombination of chromosomes during meiosis (Redford et al., 2019).

Recourse/non-recourse. Refers to the right, in an agreement, to demand payment from the person who is taking on an obligation. A full recourse loan refers to the right of the lender to take any assets of the borrower if repayment is not made. Non-recourse is when the pay-back of a certain loan is fully determined by the revenue generated by a specific activity/project and the bank or lender is not entitled to access the borrower's principal assets in the event of default.

Recoverable grants. Recoverable grants are, in essence, zero interest rate loans, in which the principal is returned to the donor / lender, on either a short-term or long-term basis depending upon the objectives and circumstances.

Recovery. Restoration of natural processes and genetic, demographic, or ecological parameters of a population or species, with regard to its state at the initiation of the recovery activities. It also refers to its past local abundance, structure and dynamics, to resume its ecological and evolutionary role, and the consequent improvement regarding habitat quality.

Recruitment. The influx of new members into a population by reproduction or immigration.

Recruitment overfishing. Recruitment overfishing occurs when the adult population is fished so heavily that the number and size of the adult population (or spawning mass) is reduced to the point that it did not have the reproductive capacity to replenish itself.

Recycled plastic. A plastic made from recovered and recycled material. The term “secondary” is often used interchangeably with “recycled” (Boucher et al., 2019).

Red grouse. The British subspecies *Lagopus lagopus scoticus* of the willow ptarmigan.

(IUCN) Red List of Threatened Species™. Listing of the conservation status of the world's flora and fauna administered by IUCN. The IUCN Red List of Threatened Species™, known as the IUCN Red List, is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognised as the most authoritative guide on the status of biological diversity.

Re-enforcement. The release of individuals to supplement a remnant population.

Refining. Purifying matter or impure metal; undertaken to obtain a pure metal or mixture with specific properties.

Reforestation. Direct human-induced conversion of non-forested land back to forested land. In the context of the Kyoto Protocol to the UNFCCC, reforestation can take place on land that was historically forested but as of December 31, 1989 was subject to another land-use.

Refugia. Regions that during climatic upheaval, biological stress or major population downsizings, still provide the essential elements of the species' niche for small subpopulations (Calvin, 2002). For example, shaded areas of coral reefs could provide refugia during bleaching events.

Regional Fisheries Management Organisations (RFMOs). Affiliations of nations which co-ordinate efforts to manage fisheries in a particular region. RFMOs may focus on certain species of fish (e.g the Commission for the Conservation of Southern Bluefin Tuna) or have a wider remit related to living marine resources in general within a region (e.g. the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)).

Rehabilitation (of ecosystems). Re-establishment of part of the productivity, structure, function and processes of the original ecosystem.

Re-establishment. It is a synonym of re-introduction (see below), but implies that the re-introduction has been successful (IUCN, 1995). The principle aim of a re-introduction should be to establish a viable, free-ranging population in the wild. The key difference between introduction and re-introduction is whether or not the species or subspecies is being released outside or inside its historic range.

Re-introduction. The release of individuals into a formerly occupied area after the native population have become extinct.

Release of insects carrying a dominant lethal (RIDL). Release into the wild of insects carrying a dominant lethal gene or genetic system (Redford et al., 2019)

Relict. An organism that at an earlier time was abundant in a large area but due to some major change (such as climatic or land use) is now occurring at only one or a few small areas.

Remedial action. Actions taken to remedy or correct a situation, to return something to its previous or proper state.

Remote sensing. Methods for gathering data on a large or landscape scale which do not involve on-the-ground measurement, especially satellite photographs and aerial photographs; often used in conjunction with Geographic Information Systems.

Renewable internal freshwater resources per capita. Renewable internal freshwater resource flows refer to internal renewable resources (internal river flows and groundwater from rainfall) per person, in the country (IUCN, 2021).

Re-nesting. A second attempt of nesting after a bird's first clutch was lost.

Replacement Cost valuation methods. A Cost Based Approach technique for valuing ecosystems or environmental resources that assesses ecosystem values by determining the cost of man-made products, infrastructure or technologies that could replace ecosystem goods and services.

Replication. The process by which multiple samples of any habitat types are secured in a network of protected areas. Replication helps to spread the risk of any large-scale event destroying all protected examples of any habitat type.

Repopulation. Planned release into the natural habitat, of specimens of the same wild subspecies or, in the event the existence of subspecies had not been determined, of the same wild species, for the purpose of strengthening a reduced population.

Representation. The inclusion of a full range of habitat types into a protected area system. Representation of all habitat types helps to ensure that the full complement of species for that habitat type is protected.

Reproductive capacity. The relative ability of an organism to produce viable offspring (measured by numbers of offspring or their rate of survival to the stage of reproduction).

Remedial action. Actions taken to remedy or correct a situation, to return something to its previous or proper state.

Remotely-sensed data. Data collected about an object or event without there being any physical contact with the object or event. Examples are satellite imaging and aerial photography (NOAA, 2005).

R-selected species. A species selected for its superiority in variable or unpredictable environments; a species typified by rapid growth rates, small size, high natural mortality and high fecundity (*cf.* **K-selected species**).

Resilience (of ecosystems). Their ability to function and provide critical ecosystem services under changing conditions.

Resistance. The capacity of an organism or a tissue to withstand the effects of a harmful environmental agent.

Resource deterioration. The utilization of a resource that lessens its total actual or potential availability, in the present or future time.

Resources. It is understood as goods and means. There are several types of resources, including: economic or productive (like the land, equipment, tools, work, credit); political (like leadership capacity, information and organization); and temporary (which is one of the most scarce resources for women).

Restoration (of ecosystems). All of the key ecological processes and functions are re-established and all of the original biodiversity is re-established.

Retention. Avoidance of dispersal from a natal site either due to specific hydrographical features or by active behavioral processes used by the larvae (Mora & Sale 2002).

Revegetation. Re-establishment of non-forest vegetation and restoration of degraded non-forested lands, such as overgrazed native grasslands or cultivated wetlands.

Rheophyte. Plants adapted to flowing water.

Rhizoid. Filamentous structure that anchors the plant to the substrate.

Rhizome. Horizontal underground “stem” that connects the various shoots of a clone.

Rhizosphere. The area surrounding roots and rhizomes.

Ridge till. Conservation tillage system where soil is left undisturbed from harvest to planting except for nutrient injections. Planting is completed in a seedbed prepared on ridges and residue is left on the soil surface between ridges.

Rift valley. An elongated trough bounded on both sides by faults, their movement causing the land surface to be lowered compared with the surrounding land. An example in the East African Rift Valley (Crofts et al., 2020).

Rights. The goods that a person or group may acquire based on prerogatives, opportunities, property or social custom.

Rightsholders (stakeholders). In the context of protected areas and conservation, the term 'rightsholders' refers to people (such as but not limited to landowners) socially endowed with legal or customary rights with respect to land, water and natural resources. By contrast, 'stakeholders' possess direct or indirect interests and concerns about these resources but do not necessarily enjoy a legally or socially recognised entitlement to them (Borrini-Feyerabend et al., 2013).

Risk. The probability that a situation will produce harm under specified conditions. It is a combination of two factors: the probability that an adverse event will occur; and the consequences of the adverse event. Risk encompasses impacts on human and natural systems, and arises from exposure and hazard. Hazard is determined by whether a particular situation or event has the potential to cause harmful effects.

Risk assessment. The structured process for analysing risk (Redford et al., 2019).

Risk-benefit analysis. A decision tool that focuses on the prevention of events carrying serious risks and assesses the costs of inaction as the likelihood of the specified risk occurring.

River basin. A watershed area usually used to describe a large land area that drains into a major river.

River mouth. The place where a river or estuary meets the sea, extending its area of influence one kilometer on each side of the river mouth, in order to complete a semicircle taking the center of the mouth as the starting point.

Robust. The ability of a geoheritage feature or process to withstand damage arising from natural causes or human intervention (Crofts et al., 2020).

Rocks. Solid matter in mineral or organic form, forming part of the Earth's crust. It is subdivided by its origins into three main types: *sedimentary*, *igneous*, and *metamorphic*. *Sedimentary rocks* are formed from pre-existing material by soft materials (*sediments*) being deposited by water, ice or wind into rivers, lakes and oceans or onto the ground surface, and subsequently transformed to form more solid material. *Carbonate* rocks, such as *limestone*, dolostone, and the *evaporite* rocks, such as gypsum, anhydrite and salt, are particular types of sedimentary rocks found in karst areas. *Limestones*, sandstones and mudstones are common examples of sedimentary rocks. *Igneous* or *Magmatic rocks* result from the slow solidification of magma below the Earth's surface and are called *intrusive* rocks (i.e. *granite*). These rocks can also be formed on the surface due to lava cooling associated with volcanic activity and are called *extrusive* rocks (i.e. basalt). *Metamorphic rocks* are rocks previously formed by sedimentary or igneous processes that have been changed into different minerals and structure as a result of heat and/or pressure often associated with the movement of tectonic plates or in contact with magma. For example, marble is metamorphosed limestone (Crofts et al., 2020).

Role. The role, function or representation a person plays within society. This role is based on a system of values and customs that determines the type of activities a person should develop.

Roost. Locations used by birds outside feeding periods. These are sites occupied during the high tide by species that feed on the mudflats or at night by birds that feed only during daytime.

Rosette. A flattened, rose-like group of leaves at the base of a stem.

Runoff. The portion of precipitation that runs off the surface as opposed to soaking in.

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S

Sacred site. An area of special spiritual significance to peoples and communities.

Sacred natural site. Areas of land or water having special spiritual significance to peoples and communities.

Salinity. The amount of salt dissolved in sea water. It is the amount of salt dissolved in parts per one thousand (ppm).

Salinization. The accumulation of salt in soil and water to a level that causes degradation and prevents the growth of plants; it may be caused by irrigation as salts brought in with the water remain in the soil as the water evaporates.

Salty. Water which proportion of dissolved salt makes it unsuitable for drinking.

Sanitary and phytosanitary measures. Any measure applied a) to protect human, animal or plant life or health (within a Member's Territory) from the entry establishment or spread of pests, diseases, disease carrying organisms; b) to prevent or limit other damage (within the Member's Territory) from the entry, establishment or spread of pests.

Saproxylic. Wood-inhabiting species that make up a significant portion of the species richness in forests and facilitate a key ecosystem function through wood decomposition and nutrient recycling.

Savanna. A type of grassland usually dotted with trees supported by a wet season and dry season and frequent natural fires, typical of subtropical regions, particularly in Africa.

Saxicolous. Growing on or among rocks.

Scavenger. Animal that eats the remains of dead animals or plants.

Scenario. A climate scenario is a coherent, internally consistent and plausible description of a possible future state of the climate. Similarly, an emissions scenario is a possible storyline regarding future emissions of greenhouse gases. Scenarios are used to investigate the potential impacts of climate change: emissions scenarios serve as input to climate models; climate scenarios serve as input to impact assessments.

Scenario analysis. A process of analyzing possible future events by considering alternative possible outcomes or scenarios.

Scientific name. The formal binomial name of a particular organism, consisting of the **genus** and specific names; a species only has one valid **scientific** name.

Sea bed. Surface of an area covered by sea water, regardless of the tidal system.

Seagrass. Flowering plant found in marine or estuarine waters that tend to develop extensive underwater meadows (NOAA, 2005).

Seascape. A spatially heterogeneous marine region that can be delineated at a range of scales and which includes physical, geological and chemical aspects of oceans. It can be a combination of adjacent coastline and sea, such as mangroves,

coral reefs, seagrass beds, tidal marshes and deep seas. It includes the features of the geology and morphology of the sea floor as well as the living communities of the benthos, water column and surface, and often includes the influence of humans (Pittman, 2017; Fuller, 2013). Seascapes are generally large, but can be defined at a range of spatial scales.

Seaweed. See *Macroalga*.

Secondary forest. Woody vegetation regrowing on land that was largely cleared of its original forest cover (ie carried less than 10% of the original forest cover). Secondary forests commonly develop naturally on land abandoned after shifting cultivation, settled agriculture, pasture, or failed tree plantations.

Secondary habitat. An area that has become suitable as a habitat for a species due to human land use.

Secondary microplastics. Microplastics that are originating from the degradation of larger plastic items into smaller plastic fragments once exposed to the marine environment. This happens through photodegradation and other weathering processes of mismanaged waste such as discarded plastic bags, or from unintentional losses such as fishing nets (Boucher & Friot, 2017).

Second-growth. Regenerating forest after disturbance, such as fire or clear-cutting.

Sediment. Soft unconsolidated material, which range across a variety of sizes, from the finest clays and silts, through coarser sands and pebbles, to the coarsest boulders (Crofts et al., 2020).

Sedimentary rocks. See *Rocks*.

Sedimentation. The accumulation of soil and mineral particles washed into a water body, normally by erosion, which then settle on the bottom (Friedman & Friedman, 1994).

Seine netting. A fishing method using nets to surround an area of water where the ends of the nets are drawn together to encircle the fish (includes purse-seine and Danish seine netting).

Seismic activity. Earth movements noted on the ground resulting from tectonic and volcanic activities in the Earth's crust (Crofts et al., 2020).

Seismic survey. An exploration method in which strong, low-frequency sound waves are generated on the surface or in the water to find subsurface rock structures that may contain hydrocarbons. Interpretation of the record can reveal possible hydrocarbon-bearing formations.

Selection. Some individuals in a population have higher reproductive success, as they possess characteristics which make them more adapted to their environment (Redford et al., 2019)

Selection felling. A silvicultural system that removes mature timber either as single scattered individuals or in small groups at relatively short intervals, repeated indefinitely, where the continual establishment of regeneration is encouraged and an uneven-aged stand is maintained.

Semi-arid land. Semi-arid land is the portion of land with an Aridity Index of 0.20–0.50. Semi-arid lands include grasslands, savannahs, steppes and scrublands. See *Drylands*.

Sensitive issue. An issue or a company/sector which is subject to an advocacy campaign; is high profile; controversial; or otherwise likely to attract attention.

Sensitivity. A measure of the susceptibility or robustness or fragility of a particular feature or a process to damage irrespective of whether it is natural or human induced, and the degree to which it is affected or will respond (Crofts et al., 2020).

Sex. It refers to the set of hereditary biological characteristics that organize individuals in two categories: man and woman.

Sex ratio. The ratio between the number of males and females in a population.

Sexual dimorphism. Differences in size, shape, colour and behaviour etc., between males and females of a species.

Sexual division of work. It may refer to two different phenomena: the first one refers to the effective distribution of tasks between men and women, where women are assigned the care of children and elderly people, household sustenance, community services, etc. And the second one involves stereotyped ideological notions about what is considered as the appropriate occupation for each sex. While the stereotype is static, the distribution of tasks undergoes a historical transformation between genders, adapting to the specific needs of the household units in each of the stages of their development and the dynamics of the local and regional economy.

Shadow prices. Prices used in economic analysis, when market price is felt to be a poor estimate of “real” economic value.

Shallow. Slight depth of a body of water.

Shared governance protected area. Government-designated protected area where decision-making power, responsibility and account ability are shared between governmental agencies and other stakeholders, in particular the indigenous peoples and local and mobile communities that depend on that area culturally and/or for their livelihoods.

Shelter belt. A windbreak hedge taking the shape of a wooded strip that diverts wind currents moving across the ground, reducing wind chill and enhancing the growth of crops, plants and trees within the sheltered area.

Shifting baselines. Refers to the fact that people measure ocean health against the best that they have experienced in their own lifetimes—even if those measures fall far short of historical ones—which causes a lowering of standards from one generation to the next. One generation sets a baseline for what is “healthy” and “natural” based on their own experience. Successive generations see even more degraded ecosystems as “healthy,” and therefore set their standards for ecosystem health even lower (Pauly 1996).

Shot hole. A borehole in which an explosive is placed for blasting in use as the energy source for seismic activity.

Shuttle species. Species with large spores, adapted to microhabitats that disappear predictably at varying rates but reappear frequently within the same community.

Significance. A comparative expression based on either specialness or rarity or of the best example of a feature or process (Crofts et al., 2020).

Siliceous. Substance where the principal component is silica (SiO₂) (Crofts et al., 2020).

Silurian. See *Geological timescale*.

Site Condition Monitoring. See *Geomonitoring*.

Silviculture. The art and science of producing and tending forests by manipulating their establishment, species composition, structure and dynamics to fulfill given management objectives.

Silvo-pastoral systems. The combined use of forestland or woodland for both wood production and animal production.

Sink reef. A downstream reef that imports larvae of corals and other reef-related organisms from upstream source reefs (Nyström & Folke, 2001).

Social capital. Consists, in a narrow sense, of social networks and associated norms that have an effect on the productivity of the community. It is rooted in trust, and is that which facilitates cooperation and coordination for the mutual benefit of members of the group. In a broader sense the term captures vertical as well as horizontal associations, between communities and other groups such as forest agencies, forest certification groups, municipal councils, and so on.

Social learning. A learning process in which stakeholders engage to learn jointly to redefine priorities and reflect upon principles and outcomes.

Social memory. After catastrophic change, remnants (memory) of the former system become growth points for renewal and reorganisation of the social-ecological system. Social memory comes from the diversity of individuals and institutions that draw on reservoirs of practices, knowledge, values and worldviews and is crucial for preparing the system for change, building resilience, and for coping with surprises (Adger et al., 2005).

Socialization. The socio-psychological processes through which the individual is historically developed as a person and a member of society. It is through this process that the individual acquires a personal and social identity as part of the social group it belongs to. The individual takes shape as a person, with personal characteristics and features derived from this configuration process.

'Soft' engineering. The use of natural approaches, such as beach nourishment or dune regeneration, avoiding the construction of fixed structures (e.g. rock armouring), as opposed to *Hard engineering* (Crofts et al., 2020).

Soft rock. A *rock* that is relatively easily eroded and weathered by water, ice or wind. Some sandstones are a good example (Crofts et al., 2020).

Soil. Material composed of mineral particles and organic remains that overlies the bedrock and supports growth of rooted plants (Crofts et al., 2020)

Solution strategies. Series of activities adopted by people facing threats, such as resource deterioration, market collapse, conflicts or other forces affecting the viability of their subsistence.

Sonar. Equipment that propagates sound in water to detect objects by echo. Marine mammals, but also bats, locate things using the same process.

Source reef. An upstream reef that exports larvae of corals and other reef-related organisms to downstream sink reefs (Nyström & Folke, 2001).

Spawning ground. A place where fish leave their eggs for fertilization.

Speciation. The evolutionary formation of new biological species, usually by the division of a single species into two or more genetically distinct ones.

Species. A group of interbreeding individuals with common characteristics that produce fertile (capable of reproducing) offspring and which are not able to interbreed with other such groups, that is, a population that is reproductively isolated from others; related species are grouped into genera. **Acclimatised s-- (= naturalised s--).** An alien species that has been introduced and maintained within an ecosystem for so long that it is deemed to be a part of that ecosystem and in law and practice is given parity with native species. **Alien s--.** A species that is not native to the ecosystem in which it is introduced. **Casual alien s--.** Alien species that may flourish and even reproduce occasionally in an area, but which do not form self-replacing populations, and which rely on repeated introductions for their persistence (Richardson et al., 2000). **Endangered s--.** Any species which is in danger of extinction throughout all or a significant portion of its range. **Endemic s--.** Population of a species that is native to the region, and which area of distribution is restricted to a small place. **Exotic s--.** An introduced species not native or endemic to the area in question. **Indicator s--.** Indicates certain environmental conditions or suitable habitats for other species. **Indigenous s-- (= native species).** A species that is assumed be intrinsically part of the ecosystem, owing to having developed there, having arrived in the area long before record of such matters was kept, having arrived by natural means (unaided by human action), etc. **Invasive s--.** This refers to a subset of introduced species or non-native species that are rapidly expanding outside of their native range. Invasive species can alter ecological relationships among native species and can affect ecosystem function and human health. **Non-native s--.** A species, subspecies or lower taxon introduced outside its normal past or present distribution; includes any parts, gametes, seeds, eggs or propagules of such species that might survive and subsequently reproduce. **Opportunistic s-- (also called r-strategist).** Species that grow and multiply fast when conditions are favourable. **Pioneering s--.** Species that establishes itself in a barren environment. **Rare s--.** Worldwide populations of small species, that are not currently endangered or are not vulnerable, but that may face such risks in the future. These species are located in geographically restricted areas or specific habitats, or are scantily scattered on a large scale. **S-- redundancy.** The presence of multiple species that play similar roles in ecosystem dynamics, thus enhancing ecosystem resilience (SER, 2004). **S-- richness.** The number of species in a given site. **Subs--.** A morphologically, behaviourally, ecologically and geographically distinct variety within a species. Individuals of different subspecies are able to produce fertile young. **Threatened s--.** Any species which is likely to become endangered within the foreseeable future

throughout all or a significant portion of its range. **Undescribed s--**. An organism not yet formally described by science and so does not yet have a formal binomial **scientific name**. Usually assigned a letter or number designation after the generic name, for example, *Squatina* sp. A is an undescribed species of angel shark belonging to the genus *Squatina*. **Vulnerable s--**. Living beings classified as “threatened” in the near future if causal factors persist. Among these are included the species which majority or entire population is diminishing due to overexploitation, vast destruction of the habitat, or other environmental disturbances. Also considered are the populations that have been significantly decreased and which safety has not been attained, and the distribution of populations are still abundant but being affected by adverse factors.

Specimen. Any living or dead animal or plant.

Speleology. The scientific study of caves and their formation and processes (Crofts et al., 2020).

Speleothems. A general term for all mineral deposits formed in caves. Most are formed of calcite and the precipitation process is the reverse of the *limestone dissolution* process. Common forms include dripstones (e.g. stalactites and stalagmites) and flowstones (Crofts et al., 2020).

Spherical. Round or globular in shape.

Spillover. The emigration of adults and juveniles across the MPA borders.

Spur. A hollow, tubular extension to a petal in some flowers, often containing nectar.

Squalene. A long-chain hydrocarbon found in the liver oil of some **cartilaginous fishes** and harvested from some deepwater species for medicinal, industrial and cosmetic uses.

SRY mice. Sry is a sex-determining gene that regulates testis differentiation; in SRY mice this gene is placed on an autosome and offspring are only male (Redford et al., 2019).

Stakeholder. From a corporate perspective, a stakeholder can be defined as “any group or individual who can affect or is affected by the achievements of the company's objectives.”

In the context of protected areas and conservation, the term stakeholder (or ‘rightsholders’) refers to people (such as but not limited to landowners) socially endowed with legal or customary rights with respect to land, water and natural resources. By contrast, ‘stakeholders’ possess direct or indirect interests and concerns about these resources but do not necessarily enjoy a legally or socially recognised entitlement to them (Borrini-Feyerabend et al., 2013).

Stalk. The slender stem that supports a leaf or a flower.

Stamen. The male reproductive organ of a flower that produces pollen.

Standardised Precipitation-Evapotranspiration Index (SPEI). The SPEI is a multiscalar drought index based on climatic data. It can be used for determining the onset, duration and magnitude of drought conditions with respect to normal

conditions in a variety of natural and managed systems such as crops, ecosystems, rivers, water resources, and so forth (IUCN, 2021).

Stated preference approaches to valuation. A group of techniques of valuation that ask consumers to state their valuation of or preference for specific ecosystem goods and services directly, including contingent valuation, conjoint analysis and choice experiments methods.

Statutory fishing rights. A fishing permit or licence giving an operator the right to operate in a fishery according to the terms established by the authority regulating the fishery.

Sterile insect technique (SIT). A technique in which sterile individuals of a species are generated in the lab (e.g. through radiation) and then released into the wild (Redford et al., 2019).

Sterile male. Sterile males are released into nature such that, when mating with wild females, there are no offspring. Males are sterilised either through radiation or by genetic manipulation (Redford et al., 2019).

Stock. A group of individuals in a **species**, which are under consideration from the point of view of actual or potential utilisation and which occupy a well defined geographical range independent of other stocks of the same species. A stock is often regarded as an entity for management and assessment purposes.

Stolon. Similar to a rhizome, but exists above ground, sprouting from an existing stem.

Straddling fish stocks. As defined under **UNFSA**, straddling fish stocks are those that straddle the boundary of a State's **EEZ** and the high seas (some stocks straddle 'out' of an **EEZ** while others straddle 'into' an **EEZ**).

Strategic Environmental Assessment (SEA). A systematic decision-support process, aiming to ensure that environmental issues are considered effectively in policy, plan and programme making (Crofts et al., 2020).

Stratigraphy. A branch of geology concerned with the form, arrangement, geographic distribution, chronologic succession and correlation of rock strata with sedimentary origin (Crofts et al., 2020).

Stressor. That part of the activity that will affect a particular ecosystem component.

Strutting ground. The display ground or lek of sage grouse.

Strutting. The display of the male sage grouse in the mating season.

Subalpine. The vegetation zone below the treeline in high mountain areas. The transition between montane forest and alpine grassland characterized by krummholz and scattered trees.

Sub-catchments. A watershed area usually used to describe a smaller part of a river basin draining into a tributary stream. Similar to micro-catchments.

Subordination. The institutional change process whereby the decision-making power is transferred to the appropriate lower level, guaranteeing that power and resources are equitably transferred to ensure the importance of the decisions made.

Subpopulation. Geographically or otherwise distinct groups in a **population** between which there is little exchange.

Subsidies. Monetary grants given by a government to lower the price faced by producers or consumers of a good, generally because it is considered to be in the public interest. A subsidy is essentially the opposite of a tax.

Subsistence. Capabilities, goods (including material and social resources) and activities required as a means to survive. Sustainable subsistence implies the ability to deal with tensions and shocks and recover from them, while maintaining or improving capabilities and goods both, at the present time as well as in the future, without undermining the natural resource base.

Subsistence fishery. A fishery where the fish landed are shared and consumed by the families and kin of the fishers instead of being sold on to the next larger market.

Substitute good. A good or service which is used in place of, or competes with, another.

Subsoil. The soil beneath the topsoil; compacted, with little or no organic material.

Sustainable use. The use of components of biological diversity in a way and at a rate that does not lead to the longterm decline of biological diversity, thereby maintaining the potential to meet the needs and aspirations of present and future generations (CBD, Art. 2, 1992).

Substrate. The material making up the base upon which an organism lives or to which it is attached (NOAA, 2005).

Succulent. A plant adapted to arid conditions and characterized by fleshy water-storing tissues that act as water reservoirs.

Suppression. Reducing population levels of the invasive alien species to an acceptable threshold.

Surrogate Market approaches to valuation. A group of techniques of valuation that look at the ways in which the value of ecosystem goods and services are reflected indirectly in people's expenditures, or in the prices of other market goods and services, including travel cost and hedonic pricing methods.

Surroundings. The set of natural, artificial or man-induced elements that make possible the existence and development of the people and all other living organisms that interact within a given space and time.

Survey. Examining an area for the occurrence, distribution and population density of a species.

Sustainability. It refers to the adequate access, use and management of the natural resources, to ensure that the men and women of present and future generations are able to meet their basic needs on an uninterrupted basis. Pattern of behaviour that guarantees for each of the future generations, the option to enjoy, at the very least, the

same level of welfare enjoyed by the preceding generation. Emphasis is placed on the intergenerational equity of development.

Sustainable development. Means using natural resources in a way that avoids irreversible damage to ecosystem structure and function, the loss of irreplaceable features or a reduction in ecosystem resilience. Environmental interests must be considered alongside social and economic interests, so as to prevent the irreplaceable loss of natural features, function or processes and to ensure a long-term and dependable flow of benefits from the exploitation of renewable resources. Delivering such sustainable development will involve significant measures to recover ecosystem structure and function, where the flow of benefits is already reduced or impaired, or where ecosystem resilience is at risk.

Sustainable Development Goals. The Sustainable Development Goals are a universal call to action to end poverty, protect the planet and improve the lives and prospects of everyone, everywhere. The 17 Goals were adopted by all United Nations Member States in 2015, as part of the 2030 Agenda for Sustainable Development which set out a 15-year plan to achieve the Goals.

Sustainable human development. It is a process to broaden people's options. It goes beyond income and economic growth, to cover full flourishing of the human capacity. It places the human being (its needs, expectations and opportunities) at the core of the concerns and activities focusing on men and women alike, as well as for present and future generations.

Sustainable Land Management. Sustainable Land Management is the use of land resources, including soils, water, animals and plants, for the production of goods, in ways that protect the long-term productivity of the land and maintain ecosystem functionality. It is defined by the UNCCD as follows: Sustainable land management combines technologies, policies and activities, aimed at integrating socio-economic principles with environmental concerns, so as to simultaneously: maintain or enhance production/services (Productivity); reduce the level of production risk (Security); protect the potential of natural resources, and prevent degradation of soil and water quality (Protection); be economically viable (Viability); and socially acceptable (Acceptability) (Sanz et al., 2017).

Sustainable management. Management through which the present potential of the resources is used in the best possible way, and does not reduce the availability of the resources.

Sustainable use. The use of an organism, ecosystem or any other renewable resource at a rate within the bounds of its capacity for renewal.

Swell. Undulating movement that stirs the sea, produced by the force of wind on the surface of water.

Symbiosis. Any type of a close and longer-term biological interaction between two different biological organisms, be it mutualistic (benefits for both), commensalistic (benefits for one while no harm to the other) or parasitic (benefits for one while causing harm to the other). The organisms, each termed a symbiont, may be of the same or a different species (Redford et al., 2019).

Sympatric. Different **species** which inhabit the same or overlapping geographic areas.

Synergy. Combined and simultaneous action of two or more forces, so that the resulting total effect is greater than the sum of the parts. It is the effect of network work.

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T

Taiga. The boreal forest. Dominated by conifers.

Tailings. Finely ground rock waste: material rejected from a mill when the recoverable minerals have been extracted.

Tanks. According to FAO, “Tanks are a fish or water holding structure, usually above ground, typically with a high water turnover rate and highly controlled environment”.

Target catch. The catch which is the subject of directed **fishing effort** within a fishery; the catch consisting of the species primarily sought by fishers.

Taungya. A means of re-establishing forest cover through initial intercropping of forestry and agricultural crops.

Taxes. Financial charges or other levies imposed on an individual or corporation by a government. Also known as ‘duties’.

Taxon (plural: taxa). A formal taxonomic unit or category at any level in a classification (**family, genus, species**, etc.).

Taxonomic diversity. Variety of species or other taxonomic categories.

Taxonomy. Refers to the system that classifies all worldwide species including plants, animals and microorganisms.

Temperate zone. The vegetation zone between the boreal forest and the subtropics. By nature dominated by deciduous forests, most of this zone has been converted into farmland.

Tenure. Socially defined agreements held by individuals or groups, recognized by legal statutes or customary practice, regarding the “bundle of rights and duties” of ownership, holding, access and/or usage of a particular land unit or the associated resources there within (such as individual trees, plant species, water, minerals, etc).

Tenure rights. The legal regime in which land is owned by an individual, who is said to ‘hold’ the land.

Terrane. An area of land where the rocks and structures are of a similar age and type and with a similar early geological history (Crofts et al., 2020).

Territory. An area defended and/or exclusively used by an individual.

Tetrapods. Vertebrates with four legs (or other appendages).

Threatened species. Threatened species are species facing “a high risk of extinction in the wild”, that is, meeting the thresholds for assessment on the IUCN Red List of Threatened Species™ under the categories of Critically Endangered, Endangered, or Vulnerable.

Threshold/tipping point. A point or level at which ecosystems change, sometimes irreversibly, to a significantly different state, seriously affecting their capacity to deliver certain ecosystem services.

Tidal. It refers to the system of water influenced by the ocean.

Tidal mixing. Occurs when strong tidal currents mix the water column (Davis & Browne, 1997).

Timber. Any wood or tree which has felled or has been felled or cut off and all wood whether unsawn, hewn, sawn or machined, split, or otherwise cut up or fashioned and shall include lumber, flooring strips, shingles, and sleepers but does not include any article manufactured from such wood or firewood (*Forest Act, 2002*).

Timber trade. Covering all activities from logging through to export.

Topography. The configuration of the surface of land, including the position of natural objects.

Topsoil. The surface layer of soil, which is rich in humus and other organic material, living and dead; generally has a loose, crumbly structure.

Tor. A free-standing rock tower formed *in situ* by weathering of the surrounding weaker rock and its removal downslope (Crofts et al., 2020).

Total Allowable Catch (TAC). The total catch allowed to be taken from a resource within a specified time period (usually a year) by all operators; designated by the regulatory authority. Usually allocated in the form of quotas.

Total Economic Value. The sum of all marketed and non-marketed benefits associated with an ecosystem or environmental resource, including direct, indirect, option and existence values.

Traceability (aquaculture). This is the ability to track the movement of an aquaculture product or inputs such as feed and seed through specified stage(s) of production, processing and distribution. It is based on documentation and other evidence by which a certified product can be traced from a specific buyer all the way back through the chain of custody to the certified production area from which it originated.

Trade-offs. A choice that involves losing one quality or service (of an ecosystem) in return for gaining another quality or service. Many decisions affecting ecosystems involve trade-offs, sometimes mainly in the long term.

Traditional knowledge (TK). Knowledge, know-how, skills and practices that are developed, sustained and passed on from generation to generation within a community, often forming part of its cultural or spiritual identity (Verschuuren et al., 2021).

Traditional Ecological Knowledge (TEK). A cumulative body of knowledge and beliefs, handed down through generations of cultural transmission, about the relationship of living beings (including humans) with one another and their environment. Further, TEK is an attribute of societies with historical continuity in resource use practices; by and large, these are non-industrial or less technologically advanced societies, many of them indigenous or tribal (International Development Research Centre, Canada; Mitchell et al., 2018).

Trammel net. A net whose inner fine-meshed layer is carried by the fish through the coarse-meshed outer layer, enclosing it in a pocket.

Transaction costs. The costs that arise in the process of trading with others, on top of the price of the good or service exchanged.

Transboundary resource management. Transboundary resource management refers to any process of cooperation across boundaries to facilitate or improve the management of natural resources (IUCN, 2021).

Transgene. A gene or genetic material that has been transferred naturally, or by any of a number of genetic engineering techniques from one organism to the other. The introduction of a transgene (called “transgenesis”) has the potential to change the phenotype of an organism (Redford et al., 2019).

Transhumance. Seasonal migration of livestock to suitable grazing grounds.

Translocation. The deliberate and mediated movement of wild individuals or populations from one part of their range to another (IUCN, 1995).

Transpiration. The loss of water vapor from a plant to the outside atmosphere, mainly through the breathing pores on the surface of a plant’s leaves and the lenticels of stems.

Transplantation. Management strategy where coral juveniles from a healthy reef are introduced onto a degraded reef (Yap et al, 1998).

Travel cost valuation methods. A *Surrogate Market Approach* technique for valuing ecosystems or environmental resources that takes the costs people pay to visit an ecosystem as an expression of its recreational value.

Trawling (trawl netting). A fishing method utilising a towed net consisting of a cone or funnel shaped net body, closed by a **codend** and extended at the openings by wings. Can be used on the bottom (**demersal trawl**) or in midwater (**pelagic trawl**).

Treeline. Altitudinal or latitudinal line or zone beyond which trees are absent.

Triple bottom line. This refers to the fact that organisations are responsible for social and environmental effects, not just financial ones.

Trophic (level). Level in the food chain (e.g. primary producer, herbivore, carnivore).

Tsunami. A series of large, fast-moving waves on the sea surface caused by earthquakes associated with movement at the margins of tectonic plates (Crofts et al., 2020).

Tundra. Treeless plains of the Arctic dominated by shrubs, grasses, lichens and mosses. Also: any habitat beyond the latitudinal (Arctic) or altitudinal (alpine) treeline. Limited by cold temperatures.

Turbidity. Cloudy water, usually caused by the suspension of fine particles in the water column. The particles may be inorganic (e.g. silt) or organic (e.g. single-celled organisms) (NOAA, 2005).

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U

Uncertainty. The degree to which a value is unknown, expressed quantitatively (for example, a range of temperatures calculated by different models) or qualitatively (for example, the judgement by a team of experts on the likelihood of a collapse of the *West Antarctic Ice Sheet*). Uncertainty in climate projections is primarily introduced by the range of projections of human behaviour which determine emissions of greenhouse gases, and the range of results from *climate models* for any given greenhouse gas.

Unconformity. A discontinuity in the rocks indicating that a time lapse (which could involve many millions of years) between the lower and upper layers has occurred (Crofts et al., 2020).

UNESCO Global Geopark. A territory recognised by UNESCO where sites and landscapes of international geological significance are managed within a holistic concept of protection, education and sustainable development. Geoparks are not considered protected areas, but rather as tools for engaging communities and business interests (Crofts et al., 2020).

Upstream operations. Includes oil and gas exploration and production (E&P) and gas processing activities.

Upwelling. The process by which warm, less-dense surface water is drawn away from a shore by offshore currents and replaced by cold, dense water brought up from the subsurface (NOAA, 2005).

Use values. A component of Total Economic Value: value derived from direct use, indirect use and options values associated with natural resources or ecosystems.

U-shaped valley. A glaciated valley with steep sides and a flattish floor formed by glacial erosion (Crofts et al., 2020).

Usufruct rights. The right to use property or generate income from property that is owned by another.

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V

Valuation, economic. The process of estimating a value for a particular good or service in a certain context in monetary terms.

Value. The geoheritage value of a site or specimen has a number of components. *Intrinsic value* means important in itself independently of human appreciation. *Scientific value* relates to the value for research and education. *Aesthetic, cultural and spiritual values* refer to human connections, interactions and appreciation of geoheritage. *Ecological value* relates to supporting biodiversity and ecosystem functioning. The diversity of substrates, landform mosaics and soil formation, together with processes such as water flow regimes, sediment supply, erosion and deposition, provide the foundations for habitats and species and ecosystem functioning. *Environmental goods and ecosystem services* values relate to the direct and indirect benefits that people receive from the natural environment and properly functioning ecosystems (Crofts et al., 2020).

Vector. Any agent that carries and transmits an infectious pathogen into another living organism (Redford et al., 2019).

Vermiform. Long, narrow, and wavy in shape.

Verrucate. That has a rough surface.

Viable population. A population large enough for long-term survival.

Vibroiseis. A seismic survey technique which uses large vehicles fitted with vibrating plates to produce shock waves.

Vicariant / Vicarious. Closely related species derived from a common ancestral population divided by geographic isolation.

Virgin plastic. A plastic made from virgin raw material i.e. the extraction of crude oil. The term “primary” is often used interchangeably with “virgin” (Boucher et al., 2019).

Viviparity. A reproductive mode where the maternal adult gives birth to live young. Encompasses **aplacental viviparity** and **placental viviparity**.

Volcano. A constructional feature formed by material reaching the Earth’s surface or on the sea bed through a naturally occurring vent or fracture at the Earth’s surface supplied from deep inside the Earth. Materials erupting through the fractures or vents are either molten - *lava* (sometimes with entrained crystals), solid – *pyroclasts*, and gaseous – water vapour, acidic gases. Eruption styles range from slow and effusive to sudden and explosive. Large volcanoes are often called central volcanoes because of their size in a system or super volcanoes because of the eruptive power with pyroclastic material spread widely around the world through atmospheric circulation. Volcanoes are often, but not always, associated with the movements at the margin of tectonic plates. The chemical composition of the erupted material is highly variable and ranges from acidic to alkaline (Crofts et al., 2020).

Vulnerability. A measure of the likelihood of damage to a geo feature or process from natural or human-induced causes. It is typically determined by considering by sensitivity to change and adaptive capacity to change (Crofts et al., 2020).

Vulnerable. When used in the context of the IUCN Red List, a taxon is classified as 'Vulnerable' when facing a high risk of extinction in the wild in the immediate future (IUCN, 2001).

Vulnerable Marine Ecosystems (VMEs). Fragile marine ecosystems in the deep sea that comprise benthic species that are vulnerable to impacts by fishing gear, and that have a low capacity to recover from disturbance as a result of conservative life histories (i.e. very slow growing, slow to mature, high longevity, low levels of recruitment), and sensitivity to changes in environmental conditions.

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W

Water footprint. The amount of fresh water used in making a product.

Watershed. An area of land that feeds water to a river, draining through the landscape into tributaries and main river channels. Also called 'catchments', 'drainage basins' or 'river basins.'

Watershed services. The benefits people obtain from ecosystems within a watershed.

Weed. A plant that is growing where it is not "wanted"; a plant pest.

Wetlands. Transitional areas between terrestrial and aquatic systems in which the water table is usually at or near the surface or the land is covered by shallow water. Under the Ramsar Convention, wetlands can include tidal mudflats, natural ponds, marshes, potholes, wet meadows, bogs, peatlands, freshwater swamps, mangroves, lakes, rivers and even some coral reefs.

Wild fauna. Land animal species that subsist subject to the natural selection processes and are freely developed. It includes the smaller populations that are under man's control, as well as household animals that turn wild as a result of abandonment, and thus, susceptible to capture and appropriation.

Wildlife. Living things that are neither human nor domesticated.

Willingness to pay (WTP). Estimate of the amount people are prepared to pay in exchange for a certain state or good for which there is normally no market price (e.g. WTP for protection of an endangered species).

Wrack. Detached seagrass leaves that collect together and drift on the water surface or are washed up on the shoreline.

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X

Xerophilous. Thriving in dry habitats.

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Y

Yield regulation. The techniques for calculating and controlling the harvesting level to ensure that sustained yield is respected.

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Z

Zooplankton. Animals that drift with the currents (usually of microscopic size).

Zooxanthellae. Dinoflagellates that live symbiotically (mutually beneficial) within a variety of invertebrate groups (e.g. coral polyps) (NOAA, 2005).

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