Definitions of Ecosystem Services

Service	Sub-category	Definition	Examples
Provisioning services			
Food	Crops	Cultivated plants or agricultural produce harvested by people for human or animal consumption as food	• Grains • Vegetables • Fruits
	Livestock	Animals raised for domestic or commercial consumption or use	• Chicken • Pigs • Cattle
	Capture fisheries	Wild fish captured through trawling and other nonfarming methods	• Cod • Crabs • Tuna
	Aquaculture	Fish, shellfish, and/or plants that are bred and reared in ponds, enclosures, and other forms of freshwater or saltwater confinement for purposes of harvesting	• Shrimp • Oysters • Salmon
	Wild foods	Edible plant and animal species gathered or captured in the wild	• Fruits and nuts • Fungi • Bushmeat
Fiber	Timber and other wood fiber	Products made from trees harvested from natural forest ecosystems, plantations, or nonforested lands	• Industrial roundwood • Wood pulp • Paper
	Other fibers (e.g., cotton, hemp, silk)	Nonwood and nonfuel fibers extracted from the natural environment for a variety of uses	• Textiles (clothing, linen, accessories) • Cordage (twine, rope)
Biomass fuel		Biological material derived from living or recently living organisms – both plant and animal – that serves as a source of energy	• Fuelwood and charcoal • Grain for ethanol production • Dung
Freshwater		Inland bodies of water, groundwater, rainwater, and surface waters for household, industrial, and agricultural uses	• Freshwater for drinking, cleaning, cooling, industrial processes, electricity generation, or mode of transportation
Genetic resources		Genes and genetic information used for animal breeding, plant improvement, and biotechnology	• Genes used to increase crop resistance
Biochemicals, natural medicines, and pharmaceuticals		Medicines, biocides, food additives, and other biological materials derived from ecosystems for commercial or domestic use	• Echinacea, ginseng, garlic • Paclitaxel as basis for cancer drugs • Tree extracts used for pest control
Regulating services			
Air quality regulation		Influence ecosystems have on air quality by emitting chemicals to the atmosphere (i.e., serving as a "source") or extracting chemicals from the atmosphere (i.e., serving as a "sink")	• Lakes serve as a sink for industrial emissions of sulfur compounds • Vegetation fires emit particulates, ground-level ozone, and volatile organic compounds
Climate regulation	Global	Influence ecosystems have on global climate by emitting greenhouse gases or aerosols to the atmosphere or by absorbing greenhouse gases or aerosols from the atmosphere	• Forests capture and store carbon dioxide • Cattle and rice paddies emit methane
	Regional and local	Influence ecosystems have on local or regional temperature, precipitation, and other climatic factors	• Forests can impact regional rainfall levels
Water regulation		Influence ecosystems have on the timing and magnitude of water runoff, flooding, and aquifer recharge, particularly in terms of the water storage potential of the ecosystem or landscape	• Permeable soil facilitates aquifer recharge • River floodplains and wetlands retain water – which can decrease flooding during runoff peaks – reducing the need for engineered flood control infrastructure

Definitions of Ecosystem Services (continued)		
Service	**Definition**	**Examples**
Regulating services (continued)		
Erosion regulation	Role vegetative cover plays in soil retention	• Vegetation such as grass and trees prevents soil loss due to wind and rain and prevents siltation of water ways • Forests on slopes hold soil in place, thereby preventing landslides
Water purification and waste treatment	Role ecosystems play in the filtration and decomposition of organic wastes and pollutants in water; assimilation and detoxification of compounds through soil and subsoil processes	• Wetlands remove harmful pollutants from water by trapping metals and organic materials • Soil microbes degrade organic waste, rendering it less harmful
Disease regulation	Influence that ecosystems have on the incidence and abundance of human pathogens	• Some intact forests reduce the occurrence of standing water – a breeding area for mosquitoes – which can lower the prevalence of malaria
Pest regulation	Influence ecosystems have on the prevalence of crop and livestock pests and diseases	• Predators from nearby forests – such as bats, toads, and snakes – consume crop pests
Pollination	Role ecosystems play in transferring pollen from male to female flower parts	• Bees from nearby forests pollinate crops
Natural hazard regulation	Capacity for ecosystems to reduce the damage caused by natural disasters such as hurricanes and to maintain natural fire frequency and intensity	• Mangrove forests and coral reefs protect coastlines from storm surges • Biological decomposition processes reduce potential fuel for wildfires
Cultural services		
Recreation and ecotourism	Recreational pleasure people derive from natural or cultivated ecosystems	• Hiking, camping, and bird watching • Going on safari
Ethical values	Spiritual, religious, aesthetic, intrinsic, "existence," or other values people attach to ecosystems, landscapes, or species	• Spiritual fulfillment derived from sacred lands and rivers • Belief that all species are worth protecting regardless of their utility to people – "biodiversity for biodiversity's sake"
Supporting services		
Nutrient cycling	Role ecosystems play in the flow and recycling of nutrients (e.g., nitrogen, sulfur, phosphorus, carbon) through processes such as decomposition and/or absorption	• Decomposition of organic matter contributes to soil fertility
Primary production	Formation of biological material by plants through photosynthesis and nutrient assimilation	• Algae transform sunlight and nutrients into biomass, thereby forming the base of the food chain in aquatic ecosystems
Water cycling	Flow of water through ecosystems in its solid, liquid, or gaseous forms	• Transfer of water from soil to plants, plants to air, and air to rain

Source: Adapted by the World Resources Institute from the reports of the Millennium Ecosystem Assessment, 2005.
For more information, see Hanson, C. et. al. 2008. The Corporate Ecosystem Services Review. Washington, DC: World Resources Institute. Available at: www.wri.org/ecosystems/esr

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