Appendix 11.1: Ecosystem Service Checklist

Ecosystem Service		Description	Example
	Crops	Cultivated plants or agricultural products harvested by people for human consumption.	Crops include food sources such as rice and maize as well as grapes and hops for drinks such as wine and beer.
	Livestock & fodder	Livestock are animals raised for domestic or commercial consumption or use while fodder is any foodstuff used to feed domesticated livestock.	Livestock includes goats, camels, and cows, while fodder is typically made up of hay, straw, silage, legumes etc.
	Capture fisheries	Aquatic organisms replenish naturally in both freshwater and marine environments. The capture of such organisms, particularly fish, provides an important protein source for billions of people worldwide.	Commonly eaten species include tuna, sardines, and cod, as well as many shellfish species.
	Aquaculture	Aquatic organisms grown in controlled conditions in both freshwater and marine environments.	Commonly harvested species include prawns, mussels, and salmon.
	Wild foods	Many societies gather wild sources of food which replenish naturally across a variety of different ecosystems.	Wild foods include plants, fungi, fruits, nuts, as well as animal, bird, insect, amphibian, and reptile species.
	Timber	A range of ecosystems produce trees which can be harvested to provide a variety of wood products.	Timber sourced from a variety of tree species is used in the construction of buildings and furniture.
	Energy	Ecosystems provide a variety of renewable energy sources, from harvestable biomass to hydropower. Fossil fuels are not considered to be ecosystem services as they aren't dependent upon the living component of existing ecosystems, so any benefits are not derived from ecosystems. Likewise solar radiation is not considered to be an ecosystem service.	Renewable energy sources provided by ecosystems such as woodfuel, biomass, tidal, hydropower etc.

Ecosystem Service		Description	Example
	Oil, gas and minerals	Oil, gas and minerals under the ocean floor are ecosystem goods created over geological time periods. Oil and gas exploration and production are increasingly taking place in deeper waters, and the pace of oil and gas exploration and production at depths greater than 300 m has accelerated rapidly in some areas.	Examples include oil, gas and minerals.
	Biochemicals / medicine	Many medicines, biocides, food additives, ethnobotanical plants, and biological materials are derived from ecosystems.	Examples include latex, morphine, aspirin, quinine etc.
	Water (supply)	Freshwater is essential for human life and occurs naturally in a range of ecosystems.	Freshwater is found in lakes, rivers, underground aquifers, as well as being held in ice and snow.
	Fibres and ornamental resources	A vast range of products are derived from plants and animals that are used as natural fibres in clothes or building materials or as ornamental resources.	This may include jute, hemp, flowers, bamboo, silk, skins, and shells.
	Genetic resources	This includes the genes and genetic information used for animal and plant breeding and biotechnology.	Natural variation in the genes of a variety of plant species has been used to develop genetically modified species which are more drought resilient, more productive etc.
	Local climate regulation	Ecosystems can influence the local climate through the level of evapotranspiration, surface albedo, temperature regulation etc. Particular groups of trees or other vegetation can also provide localised shading and temperature regulation.	The Amazon rainforest recycles an estimated 50% of its rainfall when rain evaporates from trees or evapotranspiration transfers soil moisture into the air. This produces the wet climate that the trees need to grow.

Ecosystem Service		Description	Example
	Global climate regulation	Ecosystems play an important role in global climate regulation through sequestering, storing, and emitting greenhouse gases as well as contributing to the albedo effect.	The world's peatlands are thought to contain between 180 to 455 billion metric tons of sequestered carbon.
	Hazard regulation	Ecosystems play a role in maintaining the integrity of land surfaces; maintaining soil cover and low suspended sediment loads in fluvial systems; retaining and storing water; and dissipating energy from coastal processes.	Zones of vegetation such as mangroves can play an important role as a natural buffer to coastal erosion while woodlands reduce surface water flows.
	Air quality regulation	Ecosystems contribute chemicals to the atmosphere as well as extracting them, influencing many aspects of air quality.	Trees absorb airborne pollutants such as ozone, nitrogen oxides, sulphur dioxides, carbon monoxide, carbon dioxide, and particulate matter. In urban areas particularly, trees can reduce pollution considerably.
	Water quality regulation	Ecosystems can be a source of impurities in fresh water but also can help to filter out and decompose organic wastes introduced into inland waters and coastal and marine ecosystems.	Woodlands can help protect streams from surface water runoff and create nutrient soaks that reduce the amount of pollutants and sediment reaching the water by trapping particles.
	Pollination	The distribution, abundance, and effectiveness of natural pollinators such as bees are directly dependent on ecosystems.	Bees and other insects pollinate crops, several species of bats and birds pollinate flowers, vertebrates such as monkeys and possums play a role pollinating and dispersing the seeds of various fruit trees.

Continued…

Ecosystem Service		Description	Example
	Disease and pest control	Changes in ecosystems can directly change the abundance of human pathogens such as cholera, destructive invasive species, and the prevalence of crop and livestock pests and diseases.	Temperature and water availability limit the abundance of disease vectors such as mosquitoes, while predators such as birds and spiders control agricultural pest numbers. Non-native species introduced to an area can disrupt this balance.
	Noise regulation	Noise can have both a negative and positive impact on human well-being depending on its magnitude and source (the sound of a waterfall for example may be considered positive whereas the sound of traffic may be negative). Ecosystems play an important role in noise regulation, both in terms of contributing and reducing noise.	Tree planting and soil bunds along roadsides can reduce the negative noise impacts of traffic, while birdsong contributes noise but is often considered to be welfare enhancing.
	Soil quality regulation	Soils capture and release carbon, nutrients and water, detoxify pollutants, purify water, and suppress soil-dwelling pests and pathogens. The capacity of soil for regulation is determined by the interaction of its chemical composition, physical integrity and the structure and activity of soil biodiversity. Different soil types have different inherent regulating capacities.	Certain soils are more suppressive of plant pathogens than others, while others provide better buffers against atmospheric pollutants e.g. peatland soils.
	Waste absorption and detoxification	Marine organisms store, bury and transform many waste materials through assimilation and chemical transformation, either directly or indirectly.	Oceans have a unique (though not infinite) ability to clean up sewage, waste material and pollutants.
	Tourism & recreation values	People often choose where to spend their leisure time based in part on the characteristics of the natural or cultivated landscapes in a particular area.	There are numerous recreational activities derived from ecosystems such as angling, bird spotting, white water rafting, eco-tourism, and sunbathing on beaches.

Ecosystem Service		Description	Example
	Cultural & spiritual values	The diversity of ecosystems is one factor influencing the diversity of cultures and many religions attach spiritual and religious values to ecosystems or their components. Many societies also place a high value on the maintenance of historically important landscapes and value the "sense of place" that is associated with recognised features of their environment.	In Gabon, local inhabitants derive a strong cultural identity from fishing in the area and living on land inhabited by their ancestors. The surrounding environment is used for spiritual ceremonies, the burying of dead, construction of temples, and worship of spirits who inhabit the area.
	Scientific & knowledge values	Ecosystems influence the types of knowledge systems developed by different cultures. They can also influence global knowledge systems as a source of scientific knowledge and discovery.	Local knowledge derived from ecosystem services includes bush craft and Inuit Arctic survival skills. While globally valuable knowledge can be derived from archaeological sites, fossils, and sites such as the Atacama desert where remarkably clear skies make it an ideal site for locating telescopes.
	Wild species diversity	Biodiversity is a supporting service since it underpins a number of provisioning, regulatory, and cultural services such as wild foods, fisheries, pollination, tourism opportunities etc., However, a number of studies suggest that the diversity of wild species is itself a service regardless of whether it provides a supporting role in the provision of any other services, and that people are willing to pay to protect the existence of wild species even if they do not benefit from any of the ecosystem services they support.	In societies across the world, the diversity of wild species is considered to be important and valuable. Species which are at particular risk, such as pandas, can generate significant global concern and resources devoted to their conservation.

Complete.