**A bottom-up practitioner-derived set of Essential Variables for Protected Area management.**

**Supplement A. Harmonisation tables for all variables indicated by the first EcoPotential survey (2015) and in the later surveys (2017-2018).** (B.1) ecosystem services, (B.2) ecosystem functions and structures, (B.3) threats, and the classification of the variables into variables of biotic, abiotic, or socio-economic (anthropogenic) nature

**B.1: Harmonised Ecosystem Services**

|  |  |  |
| --- | --- | --- |
| **Harmonised variable** | **Former (original) indication** | **Classification** |
| Animals of economic use | Animal Production | Biotic |
| Animals of economic use | Aquaculture | Biotic |
| Animals of economic use | Bait collection | Biotic |
| Animals of economic use | Beekeeping | Biotic |
| Animals of economic use | Capture fisheries | Biotic |
| Animals of economic use | Cattle grazing | Biotic |
| Animals of economic use | Collecting of bait | Biotic |
| Animals of economic use | Commercial fisheries | Biotic |
| Animals of economic use | Fishing | Biotic |
| Animals of economic use | Food provision | Biotic |
| Animals of economic use | Honey production | Biotic |
| Animals of economic use | Manual cockle fisheries | Biotic |
| Animals of economic use | Oyster culture | Biotic |
| Animals of economic use | Shellfish fisheries | Biotic |
| Animals of economic use | Wild foods | Biotic |
| Animals of economic use | Agriculture, meat | Biotic |
| Animals of economic use | Farmed sea food | Biotic |
| Animals of economic use | Fisheries | Biotic |
| Animals of economic use | Wild land meat | Biotic |
| Biodiversity conservation | Biodiversity Conservation | Biotic |
| Biodiversity conservation | Biodiversity protection | Biotic |
| Biodiversity conservation | Refuge for biodiversity | Biotic |
| Biodiversity conservation | Genetic resources | Biotic |
| Charismatic landscape | Aesthetic values | Abiotic |
| Charismatic landscape | Charismatic habitat | Abiotic |
| Charismatic landscape | Charismatic habitat and species | Abiotic |
| Charismatic landscape | Charismatic landscapes | Abiotic |
| Charismatic landscape | Cultural heritage | Abiotic |
| Charismatic landscape | Cultural landscape | Abiotic |
| Charismatic landscape | Iconic landscapes | Abiotic |
| Charismatic species | Charismatic reindeer | Biotic |
| Charismatic species | Charismatic species | Biotic |
| Charismatic species | Existence value (of cetaceans) | Biotic |
| Charismatic species | Presence of flagship species | Biotic |
| Climate regulation | Carbon sequestration | Abiotic |
| Climate regulation | Carbon Uptake | Abiotic |
| Climate regulation | Climate regulation | Abiotic |
| Climate regulation | Local Scale Climate Regulation | Abiotic |
| Climate regulation | Carbon sequestration and storage | Abiotic |
| Education and research | Education | Socio-economic |
| Education and research | Research | Socio-economic |
| Education and research | Scientific research | Socio-economic |
| Education and research | Education | Socio-economic |
| Education and research | Research | Socio-economic |
| Energy production | Energy production (e.g. hydropower, wind farms) | Socio-economic |
| Energy production | Geothermic water | Socio-economic |
| Fire Protection | Wildfire regulation | Biotic |
| Flood and coastal protection | Buffer for coastal erosion | Abiotic |
| Flood and coastal protection | Buffering floods | Abiotic |
| Flood and coastal protection | Coastal protection | Abiotic |
| Flood and coastal protection | Flood and erosion protection | Abiotic |
| Flood and coastal protection | Flood mitigation | Abiotic |
| Flood and coastal protection | Flood retention | Abiotic |
| Flood and coastal protection | Protection of coastline | Abiotic |
| Flood and coastal protection | Flood prevention | Abiotic |
| Food provision for animals | Fodder | Biotic |
| Food provision for animals | Food for birds | Biotic |
| Food provision for animals | Food for cattle | Biotic |
| Food provision for animals | Food for fish | Biotic |
| Food provision for animals | Grazing | Biotic |
| Food provision for animals | Sheep fodder | Biotic |
| Food provision for animals | Reed as raw material or fodder | Biotic |
| Food provision for humans | Food collection | Biotic |
| Habitat for feeding and breeding | Breeding places and shelter for birds | Abiotic |
| Habitat for feeding and breeding | Feeding and staging grounds for birds | Abiotic |
| Habitat for feeding and breeding | Feeding grounds for birds | Abiotic |
| Habitat for feeding and breeding | Feeding grounds for fish | Abiotic |
| Habitat for feeding and breeding | Fishing ground | Abiotic |
| Habitat for feeding and breeding | Migration corridor for fish | Abiotic |
| Habitat for feeding and breeding | Nursery area | Abiotic |
| Habitat for feeding and breeding | Nursery area for shrimp and fish | Abiotic |
| Habitat for feeding and breeding | Nutrition for cattle | Abiotic |
| Habitat for feeding and breeding | Rangeland for cattle | Abiotic |
| Habitat for feeding and breeding | Resting place for birds | Abiotic |
| Habitat for feeding and breeding | Resting place for mammals | Abiotic |
| Habitat for feeding and breeding | Resting places for birds | Abiotic |
| Habitat for feeding and breeding | Resting places for mammals | Abiotic |
| Habitat for feeding and breeding | Sanctuary for fish fry | Abiotic |
| Habitat for feeding and breeding | Spawning and nursery grounds for fish | Abiotic |
| Habitat for feeding and breeding | Water for aquaculture | Abiotic |
| Habitat for feeding and breeding | Lifecycle and habitat protection | Biotic |
| Habitat for feeding and breeding | Nursery area – supporting | Biotic |
| Hunting | Hunting | Socio-economic |
| Hunting | Selling licenses | Socio-economic |
| Hydrological regulation | Hydrological cycle and water flow maintenance | Abiotic |
| Hydrological regulation | Hydrology | Abiotic |
| Leisure activities | Birdwatching | Socio-economic |
| Leisure activities | Ecotourism | Socio-economic |
| Leisure activities | Recreation | Socio-economic |
| Leisure activities | Recreation and tourism | Socio-economic |
| Leisure activities | Recreational activities | Socio-economic |
| Leisure activities | Recreational diving | Socio-economic |
| Leisure activities | Recreational fishing and boating | Socio-economic |
| Leisure activities | Symbolic and Aesthetic values | Socio-economic |
| Leisure activities | Tourism | Socio-economic |
| Leisure activities | Recreation and tourism | Socio-economic |
| Materials of economic use | Amber extraction | Abiotic |
| Materials of economic use | Cooling water | Abiotic |
| Materials of economic use | Mining | Abiotic |
| Materials of economic use | Salt production | Abiotic |
| Materials of economic use | Amber extraction | Abiotic |
| Materials of economic use | Gitios extraction | Abiotic |
| Materials of economic use | Salt production | Abiotic |
| Plants of economic use | Agriculture | Biotic |
| Plants of economic use | Biomass (wood, food) | Biotic |
| Plants of economic use | Biomass extraction | Biotic |
| Plants of economic use | Building material | Biotic |
| Plants of economic use | Cork Production | Biotic |
| Plants of economic use | Fruit crops | Biotic |
| Plants of economic use | Fuel pellets | Biotic |
| Plants of economic use | Pine seed extraction | Biotic |
| Plants of economic use | Plant collection | Biotic |
| Plants of economic use | Thatching materials | Biotic |
| Plants of economic use | Timber | Biotic |
| Plants of economic use | Wild plants and their outputs | Biotic |
| Plants of economic use | Agriculture, grain | Biotic |
| Plants of economic use | Timber | Biotic |
| Plants of economic use | Wild non meat food products | Biotic |
| Pollination | Pollination | Biotic |
| Pollination | Pollination and seed dispersal | Biotic |
| Pollination | Pollination | Biotic |
| Prevention of erosion | Control of erosion | Abiotic |
| Prevention of erosion | Erosion regulation | Abiotic |
| Raw materials | Sand, gravel, shell extraction | Abiotic |
| Sedimentological regulation | Land incrementation | Abiotic |
| Sedimentological regulation | Maintenance of soil | Abiotic |
| Sedimentological regulation | Maintenance of soil fertility | Abiotic |
| Sedimentological regulation | Soil formation | Abiotic |
| Sedimentological regulation | Soil protection | Abiotic |
| Sedimentological regulation | Erosion prevention (coastal or inland) | Abiotic |
| Spiritual significance | Aesthetic qualities | Socio-economic |
| Spiritual significance | Spiritual significance | Socio-economic |
| Transport facilitation | Shipping lanes | Socio-economic |
| Transport facilitation | Waterway for shipping | Socio-economic |
| Waste and Toxicant mediation | Denitrification | Abiotic |
| Waste and Toxicant mediation | Dewatering of wastewater treatment sludge | Abiotic |
| Waste and Toxicant mediation | Mediation of wastes | Abiotic |
| Waste and Toxicant mediation | Nutrient Regulation | Abiotic |
| Waste and Toxicant mediation | Pollution trapping | Abiotic |
| Waste and Toxicant mediation | Toxicity regulation | Abiotic |
| Waste and Toxicant mediation | Water filtration | Abiotic |
| Waste and Toxicant mediation | Water purification | Abiotic |
| Waste and toxicant mediation | Nutrient retention | Abiotic |
| Waste and toxicant mediation | Pest and disease control | Abiotic |
| Water regulation | Fresh water | Abiotic |
| Water regulation | Water storage | Abiotic |
| Water regulation | Water supply | Abiotic |
| Water regulation | Water treatment | Abiotic |

**B.2. Harmonised Ecosystem Functions and Structures**

|  |  |  |
| --- | --- | --- |
| **Harmonised variable** | **Former (original) indication** | **Classification** |
| Biodiversity | Biodiversity | Biotic |
| Biodiversity | Bird biodiversity | Biotic |
| Biodiversity | Invertebrate biodiversity | Biotic |
| Biodiversity | Response of biodiversity to climate change | Biotic |
| Biodiversity | Vegetation biodiversity | Biotic |
| Carbon cycle | Carbon Sequestration | Abiotic |
| Carbon cycle | Carbon storage | Abiotic |
| Climate dynamics | Climate change attenuation | Abiotic |
| Climate dynamics | Climate regulation | Abiotic |
| Climate dynamics | Change of microclimate | Abiotic |
| Element cycling | Biogeochemical cycling and storage | Abiotic |
| Element cycling | Element cycling | Abiotic |
| Element cycling | Hydro-geo-eco processes | Abiotic |
| Element cycling | Water purification | Abiotic |
| Food chain energy transfer | Energy flow | Biotic |
| Food chain energy transfer | Functional connectivity | Biotic |
| Gene pool | Genetic resources | Biotic |
| Habitat suitability | Breeding grounds for birds | Abiotic |
| Habitat suitability | Disturbance regime management | Biotic |
| Habitat suitability | Dominance of palatable grasses | Biotic |
| Habitat suitability | Feeding area for birds | Abiotic |
| Habitat suitability | Habitat | Abiotic |
| Habitat suitability | Habitat availability | Abiotic |
| Habitat suitability | Habitat heterogeneity | Abiotic |
| Habitat suitability | Habitat suitability | Abiotic |
| Habitat suitability | Habitat suitability for birds | Abiotic |
| Habitat suitability | Maintenance of habitat: landscape structure | Abiotic |
| Habitat suitability | Nursery grounds | Abiotic |
| Habitat suitability | Provision of shade and shelter | Abiotic |
| Habitat suitability | Salt water | Abiotic |
| Habitat suitability | Supporting habitats | Abiotic |
| Habitat suitability | Tree Encroachment | Biotic |
| Habitat suitability | Undisturbed habitats | Abiotic |
| Hydrodynamics | Buffer against floods | Abiotic |
| Hydrodynamics | Buffering capacity | Abiotic |
| Hydrodynamics | Currents | Abiotic |
| Hydrodynamics | Evaporation | Abiotic |
| Hydrodynamics | Hydrodynamics | Abiotic |
| Hydrodynamics | Hydrologic flux and storage | Abiotic |
| Hydrodynamics | Water cycle regulation | Abiotic |
| Hydrodynamics | Water dynamics | Abiotic |
| Hydrodynamics | Water flow | Abiotic |
| Hydrodynamics | Water regulation | Abiotic |
| Hydrodynamics | Water retention | Abiotic |
| Hydrodynamics | Water supply | Abiotic |
| Hydrodynamics | Water treatment | Abiotic |
| Land- and Sea-scape | Charismatic landscapes | Abiotic |
| Land- and Sea-scape | Dunes landscape | Abiotic |
| Land- and Sea-scape | Landscape formation | Abiotic |
| Land- and Sea-scape | Landscape opportunity | Abiotic |
| Land- and Sea-scape | Seascape formation | Abiotic |
| Nutrient regulation | Nutrient regulation | Abiotic |
| Nutrient regulation | Nutrients regulation | Abiotic |
| Population dynamics | Dense canopy over-shading understory | Biotic |
| Population dynamics | Distribution and densities of pine trees | Biotic |
| Population dynamics | Distribution of pine trees | Biotic |
| Population dynamics | Dominance of meso-hygrophytic plants | Biotic |
| Population dynamics | Flowering | Biotic |
| Population dynamics | Grass quality | Biotic |
| Population dynamics | Ibex and Chamois population dynamics | Biotic |
| Population dynamics | Insect demographics | Biotic |
| Population dynamics | Invertebrate population dynamics | Biotic |
| Population dynamics | Key stone species reproduction | Biotic |
| Population dynamics | Phenology | Biotic |
| Population dynamics | Plant phenology | Biotic |
| Population dynamics | Pollination | Biotic |
| Population dynamics | Population dynamics | Biotic |
| Population dynamics | Recruitment | Biotic |
| Population dynamics | Seed dispersal | Biotic |
| Population dynamics | Sheep presence | Biotic |
| Population dynamics | Species turnover | Biotic |
| Population dynamics | Vegetation structure | Biotic |
| Population dynamics | Zooplankton population dynamics | Biotic |
| Primary production | Olive oil production | Biotic |
| Primary production | Pharmacological resources | Biotic |
| Primary production | Primary Production | Biotic |
| Primary production | Primary production of lichens | Biotic |
| Primary production | Vegetation productivity | Biotic |
| Raw materials | Raw materials | Abiotic |
| Secondary production | Productivity of fish | Biotic |
| Secondary production | Secondary Production | Biotic |
| Sediment characteristics | Regulation of soil carbon storage | Abiotic |
| Sediment characteristics | Regulation of soil fertility | Abiotic |
| Sediment characteristics | Regulation of soil structure | Abiotic |
| Sediment characteristics | Retention of soil | Abiotic |
| Sediment characteristics | Retention of soil nutrients | Abiotic |
| Sediment characteristics | Sediment retention | Abiotic |
| Sediment characteristics | Sediment transport | Abiotic |
| Sediment characteristics | Soil formation | Abiotic |
| Sediment characteristics | Soil moisture | Abiotic |
| Sediment characteristics | Soil retention | Abiotic |
| Sediment characteristics | Soil structure | Abiotic |
| Water surface characteristics | Albedo | Abiotic |
| Water surface characteristics | Surface | Abiotic |
| Weather | Weather | Abiotic |

**B.3: Harmonised Threats**

|  |  |  |
| --- | --- | --- |
| **Harmonised variable** | **Former (original) indication** | **Classification** |
| (Illegal) human activities | Conflicting activities | Anthropogenic |
| (Illegal) human activities | Illegal catches | Anthropogenic |
| (Illegal) human activities | illegal logging | Anthropogenic |
| (Illegal) human activities | Picking of plants | Anthropogenic |
| (Illegal) human activities | Poaching | Anthropogenic |
| (Illegal) human activities | Gas extraction | Anthropogenic |
| (Illegal) human activities | Hunting | Anthropogenic |
| Agriculture | Agriculture | Anthropogenic |
| Bad management | Inappropriate water management | Anthropogenic |
| Bad management | Negligent management | Anthropogenic |
| Change in land use | Abandonment | Anthropogenic |
| Change in land use | Abandonment of farming | Anthropogenic |
| Change in land use | Changes in land use | Anthropogenic |
| Change in land use | Decrease of crops | Anthropogenic |
| Change in land use | Depopulation | Anthropogenic |
| Change in land use | Development of tourist facilities | Anthropogenic |
| Change in land use | Extension port areas | Anthropogenic |
| Change in land use | Forest management around the park | Anthropogenic |
| Change in land use | Harbour Extension | Anthropogenic |
| Change in land use | Settlements | Anthropogenic |
| Change in land use | Soil tillage | Anthropogenic |
| Change in land use | Spatial planning | Anthropogenic |
| Change in land use | Urbanisation | Anthropogenic |
| Change in species | Aging of the wild stocks | Biotic |
| Change in species | Bush encroachment | Biotic |
| Change in species | Change of plant species composition | Biotic |
| Change in species | Changes in bird dispersal | Biotic |
| Change in species | Disappearing charismatic species | Biotic |
| Change in species | Extinction of species | Biotic |
| Change in species | Food competition with cultured species | Biotic |
| Change in species | Impact of bird colonies | Biotic |
| Change in species | Plant species composition | Biotic |
| Change in species | Prey decline | Biotic |
| Change in species | Species composition | Biotic |
| Change in species | Species loss | Biotic |
| Change in species | Species reduction | Biotic |
| Change in species | Storms | Biotic |
| Change in species | Succession | Biotic |
| Change in species | Successional stagnation | Biotic |
| Change in species | Sudden oak death | Biotic |
| Change in species | Invasive species | Biotic |
| Civil engineering | Increased number of dams | Anthropogenic |
| Climate change | Change in precipitation | Climate change |
| Climate change | Change in snow cover | Climate change |
| Climate change | Changes in snow cover | Climate change |
| Climate change | Climate change | Climate change |
| Climate change | Droughts | Climate change |
| Climate change | Less precipitation | Climate change |
| Climate change | Sea Level Rise | Climate change |
| Climate change | Severe drought | Climate change |
| Climate change | Temperature changes | Climate change |
| Climate change | Climate change | Anthropogenic |
| Diseases | Diseases | Biotic |
| Diseases | Forest pests | Biotic |
| Diseases | Forests pests | Biotic |
| Diseases | Pests | Biotic |
| Diseases | Pests and diseases | Biotic |
| Disturbance | Anthropogenic disturbance | Anthropogenic |
| Disturbance | Disturbance | Anthropogenic |
| Disturbance | Disturbance by humans | Anthropogenic |
| Disturbance | Human actions | Anthropogenic |
| Disturbance | Human disturbance | Anthropogenic |
| Disturbance | Off-road Vehicles | Anthropogenic |
| Disturbance | Transport | Anthropogenic |
| Encroachment | Heath and scrub encroachment | Biotic |
| Encroachment | Tree Encroachment | Biotic |
| Eutrophication | Eutrophication | Anthropogenic |
| Eutrophication | Hypertrophic conditions | Anthropogenic |
| Eutrophication | Nitrification | Abiotic |
| Eutrophication | Eutrophication | Anthropogenic |
| Exotic species | Alien species | Biotic |
| Exotic species | Exotic Species | Biotic |
| Exotic species | Invading species | Biotic |
| Exotic species | Invasive Species | Biotic |
| Extreme weather | Extreme weather | Abiotic |
| Fire | Forest fire | Abiotic |
| Fire | Forest fires | Abiotic |
| Fire | Uncontrolled burning | Abiotic |
| Fire | Wildfires | Abiotic |
| Fisheries | Bycatch in gill nets | Anthropogenic |
| Fisheries | Fisheries | Anthropogenic |
| Fisheries | Shellfish fisheries | Anthropogenic |
| Fisheries | Fishing | Anthropogenic |
| Habitat loss | Aging of marshes | Abiotic |
| Habitat loss | Forest decay | Biotic |
| Habitat loss | Fragmentation | Anthropogenic |
| Habitat loss | Habitat change | Abiotic |
| Habitat loss | Habitat loss | Abiotic |
| Habitat loss | Habitat reduction | Abiotic |
| Habitat loss | Reduction of area | Abiotic |
| Habitat loss | Reduction of intertidal area | Abiotic |
| Habitat loss | Reduction of salt marshes | Abiotic |
| Habitat loss | Urban development | Anthropogenic |
| Habitat loss | Isolation | Abiotic |
| Habitat loss | Landscape fragmentation | Abiotic |
| Harmful Algae | Algal blooms | Biotic |
| Harmful Algae | Toxic algae | Biotic |
| Hydrological changes | Decrease of sediment transport | Abiotic |
| Hydrological changes | Deepening shipping lanes | Anthropogenic |
| Hydrological changes | Dredging | Anthropogenic |
| Hydrological changes | Hydraulic | Anthropogenic |
| Hydrological changes | Hydraulic modification | Anthropogenic |
| Hydrological changes | Hydroperiod reduction | Anthropogenic |
| Hydrological changes | Increased turbidity | Abiotic |
| Hydrological changes | Increasing hydrodynamics | Anthropogenic |
| Hydrological changes | Increasing sediment loads | Abiotic |
| Hydrological changes | Increasing turbidity | Abiotic |
| Hydrological changes | Increasing wave action | Anthropogenic |
| Hydrological changes | Reduced tidal energy | Anthropogenic |
| Hydrological changes | Storm surges | Abiotic |
| Hydrological changes | Underground water extraction | Anthropogenic |
| Hydrological changes | Water management | Anthropogenic |
| Hydrological changes | Water quantity | Abiotic |
| Increased salinization | Groundwater salinisation | Abiotic |
| Increased salinization | Hypersaline conditions | Anthropogenic |
| Landscape disturbance | Gas exploitation | Anthropogenic |
| Landscape disturbance | Visual ruining of landscape | Anthropogenic |
| Overexploitation | Harvesting | Anthropogenic |
| Overexploitation | Intensive agriculture | Anthropogenic |
| Overexploitation | Intensive Grazing | Anthropogenic |
| Overexploitation | Negative impact becoming larger than profits | Anthropogenic |
| Overexploitation | Overexploitation | Anthropogenic |
| Overexploitation | Overfishing | Anthropogenic |
| Overexploitation | Overgrazing | Anthropogenic |
| Overexploitation | Over-tourism | Anthropogenic |
| Overexploitation | Too high boat density | Anthropogenic |
| Overexploitation | Forestry | Anthropogenic |
| Overexploitation | Other biological resource extraction | Anthropogenic |
| Pollution | Air pollution | Anthropogenic |
| Pollution | Atmospheric Pollution | Anthropogenic |
| Pollution | Increased pollution | Anthropogenic |
| Pollution | Pesticides | Anthropogenic |
| Pollution | Pollution | Anthropogenic |
| Pollution | Water pollution | Anthropogenic |
| Pollution | Pollution | Anthropogenic |
| Pollution | Sonar and sound pollution | Anthropogenic |
| Predation | Predation | Biotic |
| Sediment dynamics changes | Avalanches | Abiotic |
| Sediment dynamics changes | Embankments within wetlands | Anthropogenic |
| Sediment dynamics changes | Erosion | Abiotic |
| Sediment dynamics changes | Port dredging | Anthropogenic |
| Sediment dynamics changes | Sediment disturbance | Anthropogenic |
| Sediment dynamics changes | Siltation | Abiotic |
| Sediment dynamics changes | Soil loss | Abiotic |
| Tourism | Hiking impact | Anthropogenic |
| Tourism | Mountaineering, rock climbing, speleology | Anthropogenic |
| Tourism | Recreation | Anthropogenic |
| Tourism | Recreational activities | Anthropogenic |
| Tourism | Tourism | Anthropogenic |