Supplementary Materials

Appendix S1. Glossary of technical terms used

Biodiversity: biological diversity, which is the variability among living organisms, and the ecological complexes of which they are a part, including diversity within species, between species, and of ecosystems (as provided in the Resource Management Act (1991) Section 2).

Biodiversity loss: simplification of the variety of life, which can occur at a variety of scales. This can involve reductions in the representation of ecosystems, population size, number of species, or level of function of important ecosystem components.

Community: all the different species populations that live together in an area.

Connectivity: the degree to which the movement of species and processes is facilitated among and across habitats and ecosystems.

Degradation: deterioration or depletion of ecosystem properties (see below), usually by anthropogenic activities.

Ecological integrity: New Zealand's Environmental Reporting Act (2015) defines EI as 'the full potential of indigenous biotic and abiotic features and natural processes, functioning in sustainable communities, habitats, and landscapes'. Lee et al. (2005) suggest three components of EI for the purpose of indicator development: (1) environmental representation, (2) species occupancy, and (3) indigenous dominance.

Ecological sequence: a series of ecosystems or communities or different vegetation types, often physically connected, that replace one another through space.

Ecosystem: a set of organisms (community) living in an area, their physical environment, and the interactions between them.

Ecosystem or habitat loss: a change that reduces the spatial amount of ecosystems or habitats for species remaining in the landscape.

Ecosystem or ecological processes (seen here as equivalent to 'ecosystem function'): abiotic (physical) and biotic (biological) flows that are properties of an ecosystem, including the water cycle, nutrient cycling (including decomposition, plant nutrient uptake, microbial respiration, nitrification, denitrification), energy flow (photosynthesis, respiration, primary production), community dynamics (including population processes such as migration, dispersal, pollination, herbivory, population dynamics, predator–prey dynamics, competition, predation, succession, source–sink dynamics), and natural selection.

Ecosystem properties: the abiotic (physical) and biotic (biological) components, structures and processes of ecosystems and their variability in space and time.

Ecotones: areas or zones of transition between ecological communities or ecosystems.

Endemic: unique to a defined geographic location; for example, a New Zealand endemic is naturally found only in New Zealand, whereas non-endemic indigenous and recently introduced taxa are also found elsewhere in the world. New Zealand endemics can also be 'regional endemics' when they are unique to a defined region, such as an ecological region.

Forest: a community that has indigenous tree species in the canopy. We follow McGlone et al. (2010) in referring to self-supporting, woody species that attain heights ≥ 6 m high as 'trees', a definition that includes 215 indigenous species. We include secondary forests and forests that have previously been logged within this definition, as well as low forest communities that are yet to attain full stature or are limited by extreme environmental conditions.

Fragmentation: the process or state of breaking or being broken into fragments. Fragmentation not only causes loss of the amount of habitat, but by creating smaller, isolated patches it also changes the properties of the remaining habitat.

Habitat of indigenous species: the resources and conditions present in an area that produce occupancy by a given indigenous organism in any part of its life-cycle; an indigenous or non-indigenous community used by an indigenous species.

Indigenous dominance: the degree to which the structure, composition, and processes of an ecosystem are dominated by indigenous species (Lee et al. 2005).

Indigenous vegetation or ecosystem: There are two approaches to defining 'indigenous' vegetation or an 'indigenous' ecosystem. 'Indigenous' can be defined qualitatively (e.g. a plant community or ecosystem containing naturally occurring indigenous species) or quantitatively (e.g. 'a plant community or ecosystem in which indigenous vascular and non-vascular plant species comprise more than 20% of the number of vascular and non-vascular plant species present').

A drawback of a quantitative definition is that it may exclude indigenous ecosystems and habitats for indigenous species that are important for maintaining indigenous biodiversity. A drawback of a qualitative definition is that it can be difficult to know how many individuals of naturally occurring indigenous species are needed to make the vegetation indigenous. We recommend that presence (and not abundance) of indigenous plant, animal or fungi species should be a primary determinant, and that the cover or abundance of indigenous species should not be used alone to determine whether vegetation or an ecosystem is 'indigenous'. There are many ecosystems that are dominated in cover by exotic species and that are habitats (in the sense defined above) for indigenous species (e.g. indigenous wētā in gorse) and need to be regarded as indigenous vegetation if indigenous biodiversity is to be maintained.

Some definitions of indigenous vegetation specify that it includes vegetation regenerated with human help following disturbance, but do not include plantations or vegetation established for commercial or aesthetic purposes. In some cases, and especially in highly modified landscapes, vegetation established for commercial or aesthetic purposes provides important habitat for indigenous species populations (e.g. kiwi or kārearea populations in conifer plantations) and connectivity between or buffering of other habitats. In such

cases they would be habitats used by Threatened, At Risk and Data Deficient species, their fragmentation, reduction in size, or degradation would have adverse effects, and these would need to be avoided.

Maintain (biodiversity): halt (biodiversity) decline, stop a negative trend, and achieve either stasis or improvement.

Mitigate: lessen the severity of an effect.

Outlier population: a population that lies an abnormal distance outside the core range of a species. Patches of southern rata trees (*Meterosideros umbellata*) that occur along the shores of some inland South Island lakes (e.g. Lake Wānaka, Lake Sumner) are examples.

Range limits or margins: the boundary beyond which a species does not naturally occur. These boundaries can be geographic or environmental. Species populations become increasingly isolated towards range limits, and differences in many ecological and evolutionary traits, genetic differentiation, and variability in individual and population performance have been documented at or towards the geographic range limits of particular species (Gaston 2009; Sexton et al. 2009). This variation is important for species persistence, adaptation and evolution (Moritz 2002). Range limits of many will shift with environment as the climate changes.

Remediate: set right, fully reverse an effect.

Riparian vegetation: vegetation in the full riparian zone (see below) of first- (headwater) and second- order streams, and vegetation within 20 m of any third- or higher-order stream or river. Stream order is defined in the NIWA River Environments Classification.

Riparian zone: the zone in which soils and vegetation are interacting with the stream, including the high flood zone and areas in which groundwater from elsewhere in the catchment emerges at the soil surface. In low-order streams the full riparian zone is typically many times the stream width.

Shrubland: a community in which indigenous woody species that attain heights ≤6 m tall (including lianes) are in the canopy.

Species occupancy: the extent to which indigenous species that could naturally occupy an ecosystem are present (Lee et al. 2005).

References

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