Limits to offsetting

Thresholds of concern for biodiversity

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GW/ESCI-G-22/11

July 2022

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The report may be cited as:

Crisp P and Oliver M. 2022. *Limits to offsetting – Thresholds of concern for biodiversity.* Greater Wellington Regional Council, Publication No. GW/ESCI-G-22/11, Wellington.

Contents

1. Introduction

Schedule G2 (Principle 2) of Greater Wellington Regional Council's (GWRC) proposed Natural Resources Plan (2019) sets out the principles that should be applied when proposing and considering a biodiversity offset. These principles will be used when assessing the adequacy of proposals for the design and implementation of offsetting as part of resource consents issued under this Plan. Principle 2 of this Schedule sets out limits to what can be offset, recognising that many biodiversity values are not able to be offset and if the values are impacted then they will be permanently lost. These situations include where: residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected; or where there are no technically feasible or socially acceptable options by which to secure gains within acceptable timeframes. In either situation, allowing an offset would be inappropriate. "This principle reflects a standard of acceptability for offsetting, and should not be seen as a pathway to allow uncompensated losses. The project should be redesigned wherever possible to avoid effects that cannot be offset. Alternatively, the consent can be declined, or the applicant may propose some form of compensation. These limits may be identified during a consenting process, and/or through specific statutory (e.g. an RMA plan) or non-statutory provisions (e.g. a local biodiversity strategy)," (Maseyk et al 2018).

Principle 2. Limits to what can be offset

Consideration of biodiversity offsetting is inappropriate where:

> *(a) There is no appropriate site, knowledge, proven methods, expertise or mechanism available to design and implement an adequate biodiversity offset, or*
>
> *(b) When an activity is anticipated to cause residual adverse effects on an area after an offset has been implemented where:*
>
> > *i. the ecosystems or species are "threatened" (as defined by the New Zealand Threat Classification System categories: Nationally Critical (NC), Nationally Endangered (NE), and Nationally Vulnerable (NV)), or*
> >
> > *ii. the ecosystem is naturally uncommon*

This document is intended to provide guidance on ecosystems in the Wellington region where offsetting would be inappropriate, as well as identifying the nationally threatened species present in the region for which Principle 2 (b) applies. Irreplaceability and vulnerability rankings for ecosystems and species have been used in frameworks for assessing the ability to offset biodiversity impacts (Pilgrim et al 2013, Department of Conservation 2014). Offsets that are unlikely to be appropriate are identified as those where the likelihood of offset success is low and the biodiversity conservation concern is high. Schedule G2

(Principle 2) identifies the situations where biodiversity offsets where there are limits to offsetting. This document provides information about irreplaceable and vulnerable ecosystems and species in the Wellington region where those thresholds of concern for biodiversity offsets are met.

However, please note that adverse effects of activities on any of the ecosystems or species listed in this report that meet the New Zealand Coastal Policy Statement 2010 (NZCPS) policy 11(a) [indicated with an asterisk in the appendix] must be avoided. Consideration of biodiversity offsetting in these ecosystems or species is therefore not provided for.

2. Methodology

Information about naturally uncommon ecosystems and threatened species and ecosystems in the Wellington region was collated. Naturally uncommon ecosystems in New Zealand have been identified by Williams et al (2007), while the threat status of those ecosystems has been detailed in Holdaway et al (2012). The authors of the latter paper used the International Union for the Conservation of Nature (IUCN) Red List criteria for threatened ecosystems (Rodríguez et al 2011) to assess the threat status of New Zealand's naturally uncommon ecosystem types. The IUCN Red List methodology was also applied to forest ecosystem types in the Wellington region by Singers et al (2018) at a regional level. New Zealand's approach to determining the threat status of species –New Zealand Threat Classification System (NZTCS) – is similar to the IUCN Red List approach, but has been adapted for the New Zealand situation (Townsend et al 2008). This results in some differences in terminology used in the two systems, e.g. the highest threat category for the IUCN listing is "Critically Endangered", but for NZTCS, the term used is "Critical." The presence of nationally threatened species in the Wellington region was determined by searching the threatened species literature for each functional group as reported on the NZTCS website (Department of Conservation).

An assessment as to whether or not each ecosystem could be feasibly re-created was determined by GWRC staff members by evaluating whether or not each ecosystem type has developed through an unreplaceable combination of factors, such as local geology, climate. Seepage wetlands provide an example of this – they are formed in some landscapes at the head of gullies where groundwater emerges on hillsides to form soils that are mostly permanently saturated, leading to the development of a specialised plant and animal community. The landform and hydrological regime required for that ecosystem is not able to be reproduced artificially. GWRC staff members also used their knowledge of where previous efforts to recreate ecosystems have failed, (e.g. for seagrass habitat re-creation), in order to identify whether or not proven methods are available to re-establish the ecosystem type. It was also considered that adequate offsetting is not possible where the time needed to replace a vulnerable ecosystem takes more than a human generation in time. Old-growth forests for example have developmental lifespans of hundreds of years.

3. Ecosystems and species of relevance to Schedule G2, Principle 2

Each ecosystem type will be discussed separately and situations where Principle 2, Section (a) (no appropriate methodology for replacement) applies will be detailed, as will the ecosystems and species where Section (b) (no residual adverse effects) applies. There are some duplicates of ecosystems and species in the attached lists as some habitats relate to more than one ecosystem type.

3.1 Wetland ecosystems

Five wetland ecosystem types have been identified for Section (a), (Appendix 1, Table 1). Any activities that impact these wetland ecosystem types are likely to result a loss of these vulnerable ecosystem types. Four threatened, naturally uncommon ecosystems and 21 nationally threatened species have been listed for Section (b), (Appendix 1, Tables 2 and 3).

3.2 Riverine ecosystems

No riverine ecosystems have been identified as being applicable to Section (a), as activities allowed under the Proposed Natural Resources Plan in riverine systems do not, in general, impact the whole ecosystem type (as can be the case for wetlands). The exception to this is instances of stream piping, which effectively removes all existing habitat provided by the natural bed and the riparian zone in the impacted reach. There is limited potential to offset these effects, unless there are nearby artificially straightened streams that can have length added. Simple habitat enhancement will generally not result in the carrying capacity of the impacted stream being transferred into the offset stream. Wider impacts on a riverine ecosystem would also need to be considered where large water takes or works could impact natural water flow. One naturally uncommon ecosystem type and 14 nationally threatened species have been listed in Appendix 1: Tables 4 and 5, Appendix 1) for Section (b).

3.3 Lacustrine ecosystems

Three lacustrine ecosystem types have been identified for Section (a), (Appendix 1: Table 6), but as for riverine ecosystems, many activities that may have an impact on this ecosystem type will not result in the loss of the whole ecosystem. Exceptions to this could be large changes in hydrology. Four naturally uncommon ecosystem types and 20 nationally threatened species that are associated with lacustrine ecosystems are detailed in Appendix 1; Tables 7 and 8).

3.4 Coastal and marine species, habitats and ecosystems

There are a number of coastal and marine species, habitats and ecosystems in the Wellington region that would not be able to be replaced because of their unique geological setting, a poor understanding of their ecology, the complex environmental conditions required for them to thrive, and because there are no proven methods to re-create these systems. In addition, these species, habitats and ecosystems are deemed sensitive, or vulnerable, because they are highly susceptible to damage and disturbance, are geographically restricted,

and have very slow recovery (MacDiarmid et al 2013). Many of these sites and ecosystems are included in the proposed Natural Resources Plan – Schedules F4 and F5 (Appendix 1; Table 9). Ten nationally threatened species found in marine ecosystems are listed in Appendix 1; Table 10.

3.5 Coastal margin species, habitats and ecosystems

Coastal margin species, habitats and ecosystems are particularly vulnerable to the impacts of development. Climate change will also mean that sea level rise will alter the habitat availability for species that rely on these specialist habitats in the future. Eight ecosystem types have been listed for Section (a), (Appendix 1: Table 11). Three ecosystems and nine nationally threatened species have been identified in Appendix 1; Tables 12 and 13.

3.6 Forest ecosystems

Old-growth forests that remain in the Wellington region have taken thousands of years to evolve. Remnants of threatened forest ecosystem types should be considered irreplaceable, as it takes more than a generation to replace these old-growth forests. Eight threatened forest types are listed in Appendix 1; Table 14 for Section (a). One naturally uncommon ecosystem type and 14 nationally threatened species are identified in Appendix 1; Tables 15 and 16 (singers et al 2018).

3.7 Other ecosystem types

Three other naturally uncommon ecosystem types for which Section (a) applies are detailed in Appendix 1; Table 17, while associated nationally threatened species are listed in Appendix 1; Table 18 (Manaaki Whenua Landcare Research).

Acknowledgements

The authors would like to thank Alton Perry, Evan Harrison, Helen White, Megan Melidonis, Michael Greer and Roger Uys for their input to the report. We are grateful to the Department of Conservation marine and freshwater scientists for reviewing this report and national subject matter experts who have provided information about species and ecosystems in the Wellington region.

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Appendix

NB: Any ecosystems or species that meet the criteria outlined in the NZCPS policy 11(a), where they occur in the coastal environment, have been marked with an asterisk.

Table 1: Wetland ecosystem types for which no appropriate methodology for replacement is available

Ecosystem name	Threat status
Coastal turfs*	Critically Endangered
Dune slacks*	Endangered
Domed bogs	Endangered
Seepages and flushes	Endangered
Sinkholes	Endangered

Table 2: Naturally uncommon wetland ecosystems

Ecosystem name	Threat status
Ephemeral wetlands*	Critically Endangered
Lagoons*	Endangered
Lake margins	Vulnerable
Tarns	Naturally Uncommon

Table 3: Nationally threatened wetland species

Species name	Threat status
Plants	
Crassula peduncularis	Critical
Epilobium hirtigerum	Critical
Juncus holoschoenus	Critical
Sebaea ovatus	Critical
Simplicia felix	Critical
Urticularia australis	Critical
Centipeda minima	Endangered
Isolepis basilaris	Endangered
Mazus novaezeelandiae subsp. *impolitus*	Endangered
Myosurus minimus subsp. *novae-zelandiae*	Endangered
Psterostylis irwinni	Endangered

Species name	**Threat status**
Pterostylis micromega	Endangered
Amphibromus fluitans	Vulnerable
Carex cirrhosa	Vulnerable
Gratiola concinna	Vulnerable
Libertia peregrinans	Vulnerable
Spiranthes novae-zelandiae	Vulnerable
Birds	
Anas superciliosa superciliosa (grey duck)	Critical
Botaurus poiciloptilus (matuku, bittern)	Critical
Calidris canutus rogersi (lesser knot)	Vulnerable
Invertebrates	
Lepidurus apus viridis (tadpole shrimp)	Endangered
Echyridella aucklandica (kākahi)*	Vulnerable

Table 4: Naturally uncommon riverine ecosystems

Ecosystem Name	**Threat Status**
Braided riverbeds	Endangered

Table 5: Nationally threatened riverine species

Species Name	**Threat Status**
Plants	
Myosotis pottsiana	Critical
Althenia bilocularis	Vulnerable
Rorippa divaricata	Vulnerable
Fissidens berteroi	Vulnerable
Birds	
Larus bulleri (black-billed gull)*	Critical
Charadruis bicinctus bicinctus (Banded dotterel)*	Vulnerable

Species Name	Threat Status
Invertebrates	
Omanperla hollowayae	Critical
Potamopyrgus oppidanus	Critical
Hydrochorema n. sp.	Endangered
Cryptobiosella furcata	Endangered
Cryptobiosella spinosa	Endangered
Echyridella aucklandica (kākahi)*	Vulnerable
Xenobiosella motueka	Vulnerable
Fish	
Galaxias postvectis (shortjaw kōkopu)	Vulnerable
Geotria australis (lamprey)	Vulnerable

Table 6: Lacustrine ecosystem types for which no appropriate methodology for replacement is available

Ecosystem name	Threat status
Inland sand dunes	Critically endangered
Shingle beaches*	Endangered
Stony beach ridges*	Endangered

Table 7: Naturally uncommon lacustrine ecosystem types

Ecosystem name	Threat status
Ephemeral wetlands*	Critically endangered
Lagoons*	Endangered
Lake margins	Vulnerable
Estuaries*	Vulnerable

Table 8: Nationally threatened lacustrine species

Species Name	Threat status
Plants	
Pterostylis micromega	Critical
Amphibromus fluitans	Endangered
Ricciocarpos natans	Endangered
Isolepis basilaris	Endangered
Carex cirrhosa	Vulnerable
Fissidens berteroi	Vulnerable
Birds	
Anas superciliosa superciliosa (grey duck)	Critical
Egretta alba modesta (white heron)	Critical
Botaurus poiciloptilus (matuku, bittern)	Critical
Larus bulleri (black-billed gull)*	Critical
Charadruis bicinctus bicinctus (banded dotterel)*	Vulnerable
Anarhynchus frontalis (wrybill)	Vulnerable
Calidris canutus rogersi (lesser knot)	Vulnerable
Hydroprogne caspia (Caspian tern)*	Vulnerable
Poliocephalus rufopectus (New Zealand dabchick)	Vulnerable
Fish	
Geodria australis (lamprey)	Vulnerable
Invertebrates	
Orthoclydon pseudostinaria	Critical
Lepidurus apus viridis (tadpole shrimp)	Endangered
Echyridella aucklandica (kākahi)*	Vulnerable

Table 9: Marine habitat and ecosystem types that are sensitive and for which no appropriate methodology for replacement is available

Bull kelp forests (*Durviallea* spp.) *
Cook Strait shelf-edge canyon habitats*
Matikona reef habitats *
Opouawe Bank methane seeps*
Adamsiella algal beds*
Deepsea woodfall habitat*
Rhodolith beds*
Hydroid tree communities
Beds of large bivalve molluscs (horse mussels, scallops, oysters, *Dosinia* spp.) *
Mixed high current assemblages (e.g., sponge gardens) *
Tubeworm (polychaete) fields and mounds
Sea anemone meadows*
Seagrass meadows*
Brachiopod beds
Bryozoan thickets
Black coral colonies*
Giant kelp (*Macrocystis* spp.) forests*
Mixed kelp assemblages*
Seamounts*
Estuaries*

Table 10: Nationally threatened coastal and marine species

Species name	**Threat status**
Marine algae	
*Dione arcuate**	Critical
*Gelidium johnstonii**	Critical
*Gigartina dilatata**	Critical
*Prasionema heeschiae**	Critical
Gigartina sp.*	Critical
Prasiola sp.*	Critical
*Prasiola novaezelandiae**	Endangered

Species name	Threat status
Marine invertebrates	
*Smeagol climoi**	Critical
*Boccardeiella magniovata**	Critical
*Spio aequalis**	Endangered

Table 11: Coastal margin habitats and ecosystem types for which no appropriate methodology for replacement is available

Ecosystem name	Threat status
Coastal turfs*	Critically Endangered
Marine mammal haul-outs*	Critically Endangered
Seabird burrowed soils*	Critically Endangered
Shingle beaches*	Endangered
Stony beach ridges*	Endangered
Calcareous coastal cliffs*	Endangered
Coastal cliffs on acidic rock stacks*	Least concern
Coastal rock stacks*	Least concern

Table 12: Naturally uncommon coastal margin ecosystems

Ecosystem name	Threat status
Active sand dunes*	Endangered
Stable sand dunes*	Endangered
Estuaries*	Vulnerable

Table 13: Nationally threatened coastal species

Species name	Threat status
Plants	
*Leptinella nana**	Critical
*Muehlenbeckia astonii**	Endangered
*Pimelea aff villosa**	Endangered
*Atriplex buchananii**	Vulnerable
*Myosotis brevis**	Vulnerable

Species name	Threat status
Birds	
Egretta sacra sacra (reef heron)*	Endangered
Charadruis bicinctus bicinctus (banded dotterel)*	Vulnerable
Hydroprogne caspia (Caspian tern)*	Vulnerable
Lizards	
Oligosma whitakeri (Whitaker's skink)*	Vulnerable

Table 14: Forest ecosystem types (Singers et al 2018) for which no appropriate methodology for replacement is available

Ecosystem name	Threat status
Titoki, ngaio	Critically Endangered
Totara, matai, ribbonwood	Critically Endangered
Tawa, titoki, podocarp	Critically Endangered
Totara, matai, broadleaf	Critically Endangered
Kahikatea, pukatea	Critically Endangered
Totara, titoki	Critically Endangered
Kahikatea, totara, matai	Critically Endangered
Black beech	Vulnerable

Table 15: Naturally uncommon forest ecosystem types

Ecosystem name	Threat status
Cloud forests	Least concern

Table 16: Nationally threatened forest species

Species name	Threat status
Plants	
Brachyglottis pentacope	Critical
Didymodon calycinus	Critical
Gastrodia coperae	Critical
Korthasella salicorniodies	Critical
Oleria gardneri	Endangered

Species name	**Threat status**
Brachyglottis kirkii var *kirkii*	Vulnerable
Dactylanthus taylorii	Vulnerable
Kunzea serotina	Vulnerable
Pittosporum obcordatum	Vulnerable
Solanum aviculare	Vulnerable
Birds	
Notiomystis cincta (Stitchbird)	Vulnerable
Lizards	
Oligosoma aff. infrapunctatum 'southern North Island'	Vulnerable
Invertebrates	
Orthoclydon pesudostinaria	Critical
Bats	
Chalinolobus tuberculatus (long-tailed bat)	Critical
Mystacina tuberculate rhyacobi (central lesser short-tailed bat)	Vulnerable

Table 17: Other ecosystem types for which no appropriate methodology for replacement is available

Ecosystem name	**Threat status**
Cave entrances	Critically Endangered
Calcareous cliffs, scarps and tors	Vulnerable
Boulderfields of calcareous rocks	Vulnerable

Table 18: Nationally threatened plant species of other ecosystem types

Species name	**Threat status and habitat**
Simplicia felix	Critical - Mudstone
Anogramma leptophylla	Vulnerable - Rock faces
Cladia blanchonii	Vulnerable - Basalt outcrops
Geranium retrorsum	Vulnerable - Cliffs
Pimelea tomentosa	Vulnerable - Cliffs