

Limits to Offsetting – Thresholds of concern for biodiversity

1.0 Introduction

Schedule G2 (Principle 2) of Greater Wellington’s Proposed Natural Resources Plan 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).”¹

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 uncommon²*

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 2013³, Department of Conservation 2014⁴). Offsets that are unlikely to be appropriate are identified as those

¹ <https://www.lgnz.co.nz/assets/Uploads/7215efb76d/Biodiversity-offsetting-under-the-resource-management-act-full-document-....pdf>

² <https://www.landcareresearch.co.nz/publications/naturally-uncommon-ecosystems> 2013 available at www.landcareresearch.co.nz/publications/naturally-uncommon-ecosystems

³ <https://www.doc.govt.nz/Documents/our-work/biodiversity-offsets/pilgrim-et-al-2013.pdf>

⁴ <https://www.doc.govt.nz/globalassets/documents/our-work/biodiversity-offsets/the-guidance.pdf>

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.

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 2007², while the threat status of those ecosystems has been detailed in Holdaway et al 2011⁵. The authors of the latter paper used the IUCN red list criteria for threatened ecosystems (Rodríguez et al 2011)⁶ to assess the threat status of the NZ naturally uncommon ecosystem types. The IUCN red list methodology was also applied to forest ecosystem types in the Wellington region by Singers et al 2018⁷ at a regional level. New Zealand's approach to determining the threat status of species – New Zealand Threat Classification System (NZTCS)⁸ – is similar to the IUCN Red List approach, but has been adapted for the New Zealand situation. 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 website⁹.

An assessment as to whether or not each ecosystem could be feasibly re-created was determined by Greater Wellington (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

⁵ Holdaway, R.J, Wiser, S.K and Williams, P.A. 2012. Status assessment of New Zealand's naturally uncommon ecosystems. *Conservation Biology* 26 (4), p 619-629.

⁶ Rodríguez, J.P. et al. (2011). Establishing IUCN Red List criteria for threatened ecosystems. *Conservation Biology* 25(1): 21-29.

⁷ <http://www.gw.govt.nz/assets/Our-Environment/Environmental-monitoring/Environmental-Reporting/Forest-ecosystems-of-the-Wellington-region-reduced.pdf>

⁸ <https://www.doc.govt.nz/globalassets/documents/science-and-technical/bbb9.pdf>

⁹ <https://nztcs.org.nz/>

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 Marine ecosystems

There are a number of marine ecosystems and sites in the Wellington region that would not be able to be replaced because of their unique geological setting or because there are no proven methods to re-create these systems. These 10 sites and ecosystems are all included in the proposed Natural Resources Plan – Schedule F4 and F5, with the exception of black

coral (Appendix 1; Table 9). Ten nationally threatened species found in marine ecosystems are listed in Appendix 1; Table 10.

3.5 Coastal Ecosystems

Coastal 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.

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.

Appendix 1

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	
<i>Crassula peduncularis</i>	Critical
<i>Epilobium hirtigerum</i>	Critical
<i>Juncus holoschoenus</i>	Critical
<i>Sebaea ovatus</i>	Critical
<i>Simplicia felix</i>	Critical
<i>Urticularia australis</i>	Critical
<i>Centipeda minima</i>	Endangered
<i>Isolepis basilaris</i>	Endangered
<i>Mazus novaezeelandiae</i> subsp. <i>impolitus</i>	Endangered
<i>Myosurus minimus</i> subsp. <i>novae-zelandiae</i>	Endangered
<i>Pterostylis irwinni</i>	Endangered
<i>Pterostylis micromega</i>	Endangered
<i>Amphibromus fluitans</i>	Vulnerable
<i>Carex cirrhosa</i>	Vulnerable
<i>Gratiola concinna</i>	Vulnerable
<i>Libertia peregrinans</i>	Vulnerable
<i>Spiranthes novae-zelandiae</i>	Vulnerable
Birds	
<i>Anas superciliosa superciliosa</i> (Grey duck)	Critical
<i>Botaurus poiciloptilus</i> (matuku, bittern)	Critical
<i>Calidris canutus rogersi</i> (Lesser knot)	Vulnerable
Invertebrates	
<i>Lepidurus apus viridis</i> (Tadpole shrimp)	Endangered
<i>Echyridella aucklandica</i> (Kakahi)	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	
<i>Myosotis pottsiana</i>	Critical
<i>Althenia bilocularis</i>	Vulnerable
<i>Rorippa divaricata</i>	Vulnerable
<i>Fissidens berteroi</i>	Vulnerable
Birds	
<i>Larus bulleri</i> (Black-billed gull)	Critical
<i>Charadrius bicinctus bicinctus</i> (Banded dotterel)	Vulnerable
Invertebrates	
<i>Omanperla hollowayae</i>	Critical
<i>Potamopyrgus oppidanus</i>	Critical
<i>Hydrochorema</i> n. sp	Endangered
<i>Cryptobiosella furcata</i>	Endangered
<i>Cryptobiosella spinosa</i>	Endangered
<i>Echyridella aucklandica</i> (kakahi)	Vulnerable
Fish	
<i>Galaxias postvectis</i> (Short-jaw kokopu)	Vulnerable
<i>Geodria australis</i> (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	
<i>Pterostylis micromega</i>	Critical
<i>Amphibromus fluitans</i>	Endangered
<i>Ricciocarpos natans</i>	Endangered
<i>Isolepis basilaris</i>	Endangered
<i>Carex cirrhosa</i>	Vulnerable
<i>Fissidens berteroi</i>	Vulnerable
Birds	
<i>Anas superciliosa superciliosa</i> (Grey duck)	Critical
<i>Egretta alba modesta</i> (White heron)	Critical
<i>Botaurus poiciloptilus</i> (matuku, bittern)	Critical
<i>Larus bulleri</i> (Black-billed gull)	Critical
<i>Charadrius bicinctus bicinctus</i> (Banded dotterel)	Vulnerable
<i>Anarhynchus frontalis</i> (Wrybill)	Vulnerable
<i>Calidris canutus rogersi</i> (Lesser knot)	Vulnerable
<i>Hydroprogne caspia</i> (Caspian tern)	Vulnerable
<i>Poliiocephalus rufopectus</i> (NZ dabchick)	Vulnerable
Fish	
<i>Geodria australis</i> (Lamprey)	Vulnerable
Invertebrates	
<i>Orthoclydon pseudostinaria</i>	Critical
<i>Lepidurus apus viridis</i> (Tadpole shrimp)	Endangered
<i>Echyridella aucklandica</i> (Kakahi)	Vulnerable

Table 9: Marine ecosystem types for which no appropriate methodology for replacement is available

Castlepoint reef
Cook Strait shelf-edge canyons
Matikona reefs
Opouawe Bank methane seeps
Adamsiella algal beds
Deepsea woodfall habitat
Rhodolith beds
Seal haul-outs
Seagrass habitat
Black coral

Table 10: Nationally threatened marine species

Species name	Threat status
Marine algae	
<i>Dione arcuate</i>	Critical
<i>Gelidium johnstonii</i>	Critical
<i>Gigartina dilatata</i>	Critical
<i>Prasionema heeschiaie</i>	Critical
<i>Gigartina</i> sp.	Critical
<i>Prasiola</i> sp.	Critical
<i>Prasiola novaezelandiae</i>	Endangered
Marine invertebrates	
<i>Smeagol climoi</i>	Critical
<i>Boccardiella magniovata</i>	Critical
<i>Spio aequalis</i>	Endangered

Table 11: Coastal 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 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	
<i>Leptinella nana</i>	Critical
<i>Muehlenbeckia astonii</i>	Endangered
<i>Pimelea aff villosa</i>	Endangered
<i>Atriplex buchananii</i>	Vulnerable
<i>Myosotis brevis</i>	Vulnerable
Birds	
<i>Egretta sacra sacra</i> (reef heron)	Endangered
<i>Charadrius bicinctus bicinctus</i> (Banded dotterel)	Vulnerable
<i>Hydroprogne caspia</i> (Caspian tern)	Vulnerable
Lizards	
<i>Oligosma whitakeri</i> (Whitaker's skink)	Vulnerable

Table 14: Forest ecosystem types 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	
<i>Brachyglottis pentacope</i>	Critical
<i>Didymodon calycinus</i>	Critical
<i>Gastrodia coperae</i>	Critical
<i>Korthasella salicornioides</i>	Critical
<i>Oleria gardneri</i>	Endangered
<i>Brachyglottis kirkii</i> var <i>kirkii</i>	Vulnerable
<i>Dactylanthus taylorii</i>	Vulnerable
<i>Kunzea serotina</i>	Vulnerable
<i>Pittosporum obcordatum</i>	Vulnerable
<i>Solanum aviculare</i>	Vulnerable
Birds	
<i>Notiomystis cincta</i> (Stitchbird)	Vulnerable
Lizards	
<i>Oligosoma</i> aff. <i>infrapunctatum</i> 'Southern North Island'	Vulnerable
Invertebrates	
<i>Orthoclydon pseudostinaria</i>	Critical
Bats	
<i>Chalinolobus tuberculatus</i> (Long-tailed bat)	Critical
<i>Mystacina tuberculata rhyacobi</i> (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 species of other ecosystem types

Species name	Threat status and habitat	
Plants		
<i>Simplicia felix</i>	Critical	Mudstone
<i>Anogramma leptophylla</i>	Vulnerable	Rock faces
<i>Cladia blanchonii</i>	Vulnerable	Basalt outcrops
<i>Geranium retrorsum</i>	Vulnerable	Cliffs
<i>Pimelea tomentosa</i>	Vulnerable	Cliffs

Note that Greater Wellington is preparing a spatial GIS layer that details the locations of the threatened species where known. This information can be provided to consultants on request.