BEFORE THE COMMISSIONERS APPOINTED BY THE CENTRAL OTAGO DISTRICT COUNCIL

UNDER	the Resource Management Act 1991
IN THE MATTER	of RC230179 an application for a 33-lot subdivision at Rocky Point on Tarras-Cromwell Road (SH8)
BY	**TKO PROPERTIES LIMITED**
	Applicant

STATEMENT OF EVIDENCE OF ANDREW WELLS

Dated: 4 November 2024

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LAWYERS | NOTARY PUBLIC

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Statement of evidence of Andrew Wells

Introduction

[1] My name is Andrew Peter Wells.

[2] I hold the degrees of Bachelor of Forestry Science with First Class Honours (1995) from the University of Canterbury and Doctor of Philosophy (2000) from Lincoln University, where my studies were undertaken in the Department of Plant Sciences. I was later awarded a three-year Post-Doctoral Fellowship from the Foundation for Research, Science and Technology. Over the past 25 years I have worked for several Government Departments, Universities and private sector firms as a terrestrial ecologist undertaking ecological research, consultancy and teaching. I have been employed by Wildland Consultants Limited (**Wildlands**) since 2022, based in Wānaka, and my current position is Senior Ecologist.

[3] I am an author of 24 scientific papers published in peer-reviewed international and national scientific journals. I have also presented aspects of my research at national and international scientific conferences. I have lectured in plant ecology and pedology on study abroad programmes of several North American Universities. I continue to publish research papers in collaboration with other scientists as time permits. My specialty is in ecosystem and vegetation development.

[4] My work as an ecologist has covered a wide range of ecosystem types, including wetlands, grasslands, shrublands, forests, and alpine vegetation. This work has included ecological investigations in Buller, Westland, Canterbury, Otago and Southland. I am an author of over 100 contract reports covering these assessments and I have prepared expert evidence for the Environment Court or similar cases in relation to some of these projects.

[5] I am familiar with the dryland ecosystems of inland South Island, having undertaken many ecological assessments and surveys in Central Otago and Mackenzie Basin over the past 20 years.

[6] I have been instructed by TKO Properties Limited to give expert ecological evidence in respect of RC230179, an application for a 30-lot subdivision located at Rocky Point on Tarras-Cromwell Road (SH8).

Code of Conduct for Expert Witnesses

[7] While this is not an Environment Court hearing I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. This evidence is within my area of expertise, except where I state that I am relying on material produced by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Scope of evidence

[8] My evidence will address:

(a) background information regarding my involvement, and the involvement of other Wildlands' staff, in the project, including my peer review of the ecological effects of the proposal and measures proposed to remedy or mitigate those effects;

(b) an outline of the vegetation succession and climax community report prepared by Wildlands;

(c) an outline of the proposed biodiversity offset accounting models, and revisions arising from the updated information provided in Mr Beale's evidence;

(d) my response to the ecological matters relevant to offsetting raised by ecologist Mike Harding, and in the Central Otago District Council planner's section 42A report addendum;

(e) commentary on the alignment of the proposed biodiversity offsets with the offsetting principles set out in Appendix 3 of the NPSIB.

Executive summary

[9] Wildlands was engaged by TKO Properties Limited to provide technical peer review of ecological assessments prepared by Mr Beale for the proposed Rocky Point subdivision, and to participate in the formulation

and review of remediation, mitigation, offset and compensation measures in conjunction with TKO Properties Limited and Mr Beale.

[10] Rocky Point is in the early transitional stages of indigenous vegetation recovery following years of severe human-induced degradation of soils and vegetation, including fire and introduction of browsing mammals. This process involves succession from predominantly non-woody vegetation such as cushionfields to woody vegetation dominated by kānuka.

[11] Prior to human settlement, Rocky Point would have supported forest and scrub vegetation communities across almost the entire site, except for cushionfield-herbfield communities on localised areas of saline soils and persistence of shrubland and cushion plants on postglacial stony terrace escarpments. Diverse closed canopy forest would have been present on areas of deep soils (gullies and toeslopes), grading into scrub on thin soils in shaded sites, and low growing shrubland on north facing slopes with thin soils.

[12] A biodiversity offset framework was developed to deal with residual ecological effects associated with the proposed development that involves planting woody vegetation communities at locations in Rocky Point and Bendigo Hills Estate, along with an ecological and vegetation management plan outlined in Mr Beale's evidence. Biodiversity information for the offset model was obtained from vegetation plots.

[13] Two offset models were used, one based on effects on kānuka scrub-shrubland, and one based on effects on cushionfield dominated by *Raoulia australis*. The two models had different benchmarks, with the scrub-shrubland model incorporating an indigenous closed-canopy forest benchmark on deeper, moister soils, and the cushionfield model incorporating a shrubland benchmark on thinner, drier soil. The cushionfield offsetting model anticipates replacement of *Raoulia australis* cushionfield with indigenous shrubland/woodland.

[14] The mix of species suggested for the proposed offset is based on 19 species that are found today in the wider area and that were also key components of pre-settlement vegetation.

[15] The proposed offsetting is appropriate when considered in terms of the offsetting principles of the NPSIB, Otago Regional Policy Statement 2019 and proposed Otago Regional Policy Statement 2021. The irreplaceability and vulnerability of the indigenous biodiversity affected are not sufficiently high to exclude offsetting as a legitimate way of dealing with the residual effects.

[16] The offsetting model outcomes show that no net loss of indigenous biodiversity could be achieved through the proposed offset actions, and a 'net gain' in indigenous biodiversity as set out on the principles for offsetting contained in Appendix 3 of the NPSIB.

[17] The proposed offset will lead to significantly greater gains in biodiversity values than can be obtained solely from the proposed minimisation and remediation measures. Furthermore, I consider that these gains in indigenous biodiversity represent important long-term benefits for the ecology of the area that would not occur in a scenario where Rocky Point remains under a farming regime.

Background and involvement in the project

[18] Wildlands was engaged by TKO Properties Limited in November 2023 to provide technical peer review of ecological assessments prepared by Mr Beale for the proposed Rocky Point subdivision, and to participate in the formulation and review of remediation, mitigation, offset and compensation measures in conjunction with TKO Properties Limited and Mr Beale. Subsequently, Wildlands was further engaged to develop a lizard management plan, and to undertake a desktop assessment of invertebrate values. This has involved four senior Wildlands staff members.

[19] I have undertaken the following work to assist Mr Beale in developing the Ecological Impact Assessment (EIA) and related inputs:

a) Participated in a three hour fly over of the Dunstan Ecological District and adjacent Lindis, Maniototo, Old Man and Pisa Ecological Districts recording the location and extent of cushionfields.

b) Undertook ground truthing of potential offset and compensation sites focussing on the cushionfields covering low hill country in the vicinity of the Bendigo Loop Road.

c) Conducted property wide walk over surveys and RECCE plot surveys in the company of Mr Beale. The RECCE plot surveys covered areas of cushionfield and kānuka shrubland-scrub within and outside of the Rocky Point development area, potential offset sites in Rocky Point and the adjacent Bendigo Hills Estate and offset benchmark sites at Devils Creek and Firewood Creek near Cromwell. I also undertook RECCE plot surveys of offset benchmark sites at Pigeon Creek and Wānaka.

d) Prepared a report describing vegetation succession and climax communities in Rocky Point and the lower western Dunstan Range, to provide ecological context and biodiversity information for a biodiversity offset model.

e) In conjunction with Dr Kelvin Lloyd of Wildlands and Mr Beale, developed a biodiversity offset model to account for residual adverse effects of the proposed subdivision. This included identifying suitable offset sites in Rocky Point and Bendigo Hills Estate, and then formulating biodiversity offset actions.

f) Accompanied Samantha King of Wildlands on a one-day field assessment of lizard habitat and lizard values at Rocky Point.

g) Engaged in regular face to face and phone meetings with Mr Beale over the past 10 months to discuss matters relating to the revised EIA.

h) Provided a peer review of Mr Beale's revised EIA.

[20] In undertaking this work, I have also drawn on knowledge gained from recreational botanical and ecological investigations conducted over recent years in Bendigo Scenic Reserve and Bendigo Historic Reserve, including a full day exploration of the Pigeon Creek catchment in June 2024.

Vegetation succession

[21] Post-human-settlement vegetation change and vegetation succession at Rocky Point and the surrounding area was examined using the following:

- Early historical accounts of European settlers and scientists;
- Aerial and satellite imagery from the 1950s to the present;
- Palaeoecological studies in the Central Otago region;
- Field investigation of the Rocky Point site and the surrounding lower western flanks of the Dunstan Range.
- Potential natural ecosystem mapping on the Otago Regional Council website.

[22] Rocky Point is in the early transitional successional stages of indigenous vegetation recovery following years of severe human-induced degradation of soils and vegetation, including fire and introduction of browsing mammals. The first stage of succession has involved colonisation of denuded soils by the most resilient early successional species of Central Otago – cushion plants and small herbs.

[23] Reductions in fires and grazing over the past c.50 years have since enabled kānuka (*Kunzea serotina*), a hardy, unpalatable, and prolific early colonising woody species, to progressively establish within cushionfield and bare ground.

[24] Over the next 50 years kānuka-dominated shrubland will further increase in extent at the site, and is likely to be progressively succeeded by a more diverse low forest with a canopy of kōwhai (*Sophora microphylla*), kānuka and *Olearia lineata*, and a diverse shrub understorey. The diversity and complexity of forest that develops in future succession will depend largely on seed sources for woody indigenous species and level of browse by introduced mammals (including sheep as part of farming operations).

[25] The suite of cushionfield species at the site will continue to reduce in abundance as succession progresses. Exotic woody weeds such as

hawthorn (*Crataegus monogyna*) and wilding conifers will pose a growing threat to the ecological integrity of the developing indigenous woody vegetation communities.

[26] Long term ecological management proposed at Rocky Point (stock removal, weed and rabbit control) will hasten the successional transition at the site from cushionfield to woody vegetation, as the slightly more advanced succession at Bendigo Scenic Reserve demonstrates. The persistence of cushionfield at the site (other than those in saline ecosystems) would require a continuation of the management regime that induced these communities, including a continuation of stock grazing, fire, and high rabbit numbers.

Climax vegetation communities

[27] Potential climax vegetation communities (what would be there if humans had never colonised Aotearoa New Zealand) at the Rocky Point site were assessed, utilising the following:

- Palaeoecological studies in the Central Otago region;
- Potential natural ecosystem mapping;
- Field investigation of the Rocky Point site and the surrounding lower western flanks of the Dunstan Range, including RECCE plot surveys in small forest remnants.

[28] Rocky Point would have supported forest and scrub vegetation communities across almost the entire site, except for cushionfield-herbfield communities on localised areas of saline soils and persistence of shrubland, including porcupine shrub (*Melicytus alpinus*) and cushion plants on postglacial stony terrace escarpments. Closed canopy forest would have been present on areas of deep soils (gullies and toeslopes), grading into scrub on thin soils in shaded sites, and low growing shrubland on north facing slopes with thin soils.

[29] The forest and scrub at the site would have had a canopy that included kōwhai, fierce lancewood (*Pseudopanax ferox*), mānatu/lowland ribbonwood (*Plagianthus regius*), *Olearia lineata* and kānuka, and an

understorey of diverse shrubs including *Coprosma* spp., *Olearia* spp., *Carmichaelia* spp. and *Veronica* spp.

[30] While there is variance in the literature regarding the relative dominance of kānuka and kōwhai in the canopy, the weight of evidence strongly indicates a dominance of kōwhai with a much-reduced presence of kānuka compared to the present-day. This is consistent with present-day observations of woody vegetation in the district, in which the only large remnant trees remaining are kōwhai, and in which evidence of kōwhai regeneration is present around all remaining relict trees throughout the lower western Dunstan Range.

[31] Vegetation plots measured in several small patches of indigenous vegetation in the lower western flanks of the Dunstan Range provide examples of the types of forest and scrub communities that could naturally develop in the present-day environment of Rocky Point, under current conditions of introduced mammalian browse and limited seed sources. The most developed example (Firewood Creek) has formed a closed kōwhai canopy approximately 10 metres tall, with a diverse shrub layer. This young developing forest is consistent with Dr Mike Pole's description from palaeoecological reconstruction of kōwhai forest in the area with "a continuous but low (perhaps 14 metre) canopy"[1].

Biodiversity offset framework

[32] The NPSIB defines 'biodiversity offset' as "a measurable conservation outcome that meets the requirements in Appendix 3 and results from actions that are intended to:

a) redress any more than minor residual adverse effects on indigenous biodiversity after all appropriate avoidance, minimisation, and remediation measures have been sequentially applied; and

b) achieve a net gain in type, amount, and condition of indigenous biodiversity compared to that lost."

[1] Pole M. (2022). A vanished ecosystem- *Sophora microphylla* (kōwhai) dominated forest recorded in mid-late Holocene rock shelters in Central Otago, New Zealand. Palaeontologia Electronica https:/doi.org/10.26877/1169.

[33] Mr Beale's evidence outlines the application of avoidance, minimisation and remediation measures for adverse effects at the project area, and demonstrates that more than minor residual adverse effects still remain. A biodiversity offset is therefore the appropriate effects management measure to address the residual adverse effects.

[34] As required under the above definition, the biodiversity offset developed intends to achieve a measurable net gain in type, amount and condition of indigenous biodiversity compared to that lost, by utilising an offset accounting model.

Site selection for biodiversity offset plantings

[35] In selecting sites for offsetting, consideration was given to factors that would ensure offsets are consistent with the principles of biodiversity offsets contained in Appendix 3 of the NPSIB. Factors considered (with relevant principle in brackets) included:

- Proximity to Rocky Point impact zone (landscape context)
- Dominance of exotic vegetation (leakage)
- Similar potential ecosystems to those at Rocky Point (net gain)
- Relatively deep soils and sheltered aspects (long term outcomes)
- Ability to decrease fragmentation/increase connectivity of existing indigenous vegetation and habitats (landscape context)
- Areas that would increase buffering and connectivity to Bendigo Scenic Reserve (landscape context).

[36] Three sites at Bendigo Hills Estate were selected. Panorama Rise and Pylon Flat are contiguous sites, separated by an existing vehicle track. These sites adjoin areas of existing cushionfield and kānuka vegetation. Pylon Flat occurs in a sheltered gently sloping shallow gully adjoining Bendigo Scenic Reserve, and is characterised by shallow to moderately deep soils with some localised rockier areas. As noted in Mr Beale's evidence, the southeastern portion of this site was originally included in the offset site but has now been removed, because it has a low

component of indigenous vegetation (>15% cushion plants). This site has accordingly been reduced in size to avoid the areas with a small component of cushion plants, thus avoiding possible leakage as per Appendix 3 of the NPSIB.

[37] Additional land has been added to the Panaroma Rise offset site to ensure the overall area of the offset sites remains the same.

[38] Panorama Rise is a sheltered south-facing hillslope with moderate to deep soils. The site incorporates exotic grassland adjacent to established kānuka scrub. This proposed offset site has now been extended to include a larger area, to account for the removal of land at Pylon Flat, as described in Mr Beale's evidence. These additional areas are shown as Areas A-E in Appendix 1.

[39] Hemlock Gully occupies a broad southwest facing gully with an ephemeral seepage in its base. The site lies between areas of cushionfield and kānuka scrub on adjoining land over much of the extent of the site. Soils are moderately deep, and notably moist in the lower parts of the gully. A very few mature *Olearia lineata* are present near the top of the gully, otherwise the site is dominated by hemlock and exotic grasses.

[40] Panorama Rise and Hemlock Gully sites are similar in nature to the southern gully at Rocky Point, representing areas that would have historically had closed canopy forest on moderately deep soils ('kōwhai-*Olearia lineata*-kōhūhū-lowland ribbonwood forest' in Figure 5 of the Wildlands succession report). These areas retain more moisture and have higher soil fertility than the surrounding rocky country. Pylon Flat is similar in nature to the areas of shallow soil at Rocky Point, representing areas that would have historically had scrub to shrubland vegetation ('kōwhai-fierce lancewood-lowland ribbonwood/*Olearia lineata*-kānuka forest and scrub' in Figure 5 of the Wildlands succession report).

[41] Four additional areas within Rocky Point itself were also selected as biodiversity offset sites, shown in Appendix 2. All four sites occur in areas of deeper soils ('kōwhai-*Olearia lineata*-kōhūhū-lowland ribbonwood forest' in Figure 5 of the Wildlands succession report). Area 1 occupies

a gentle toeslope/terrace at the west of the property and is largely vegetated by exotic sweet briar (*Rosa rubiginosa*) and grasses. A very few shrubs of *Coprosma propinqua* and matagouri (*Discaria toumatou*) are also present at the southern end. Areas 2-4 are located within the southern gully and comprise patches of bare ground and exotic grasses/herbs, interspersed among young kānuka of varying density. In these areas, it is proposed to undertake enrichment plantings within the gaps in the kānuka (see, for example, Plate 12 on page 25 of the Wildlands succession report - this is within proposed Area 2).

Biodiversity information

[42] Biodiversity information for the offset model was obtained from vegetation plots. These were used to measure the condition of the impacted vegetation and habitat, and to sample remnants of kōwhai woodland in the landscape to assist compiling benchmarks.

[43] The approach taken in developing the offset models anticipates the natural replacement of the kānuka-*Raoulia australis* vegetation mosaic with indigenous woodland over the medium term. This is based on the Wildlands succession report and potential ecosystem mapping which show woody vegetation would have dominated the site, except on steep terrace risers and saline/sodic soils (which would have supported shrubs and cushion plants).

[44] The cushionfields represent an early successional plant community that is being succeeded by kānuka and other woody species. Replicating the cushionfields at offset sites is not in my opinion sound ecological practice as the replicated cushionfields would themselves be succeeded within a relatively short period of time. Therefore, the offsetting approach replaces the early successional vegetation with more mature vegetation, short cutting the development of more complex, higher value vegetation.

[45] The aim of the proposed offset plantings is to create woody plant communities with compositions and structures that represent potential mature communities in Rocky Point and surrounding area. The species selection for plantings was informed by the information on present-day and pre-settlement vegetation communities in the lower western flanks

of the Dunstan Range. The mature vegetation communities were developed based primarily on 19 woody species that are currently naturally occurring in the lower western flanks of the Dunstan Range, supplemented by seven additional species that were almost certainly a prominent component of the pre-settlement vegetation but are now locally extinct.

[46] I have observed 19 of these 26 woody species growing naturally in the lower western flanks of the Dunstan Range. My observations have included adults, saplings and seedlings of all 19 species. I have observed these species growing in dry, exposed rocky habitat (spurs and faces), and in sheltered gullies with more favourable soils. I am therefore confident that these species are appropriate for offset plantings, both in terms of their ability to grow well in the present environment and their suitability as climax community species at Rocky Point.

[47] The backbone of the proposed offset plantings comprises these 19 woody species that are naturally occurring in the present-day environment of the lower western flanks of the Dunstan Range. Thirteen of these species are also currently found at Rocky Point (including kānuka, kōwhai, korokio (*Corokia cotoneaster*), *Coprosma* spp. and *Olearia* spp.).

[48] As far as I am aware, the other seven proposed woody species (tī kōuka/cabbage tree [*Cordyline australis*], kāpuka/broadleaf [*Griselinia littoralis*], fierce lancewood, kōhūhū [*Pittosporum tenuifolium*], narrow-leaved lacebark [*Hoheria* angustifolia], māpou [*Myrsine australis*] and lowland ribbonwood) are no longer naturally occurring in the present-day environment of the lower western flanks of the Dunstan Range. However, all except māhoe are known by Wildlands staff to be present in Central Otago and fierce lancewood and lowland ribbonwood are known from subfossil evidence[2]. Furthermore, based on observations of planted populations of these species in the Upper Clutha basin, combined with the evidence for their widespread presence in pre-

[2] Wood, J.R. and Walker, S. (2008). Macrofossil evidence for pre-settlement vegetation of Central Otago's basin floors and gorges. New Zealand Journal of Botany, 45:239-255.

settlement vegetation, I am confident that these species would grow well in deeper soils if protected from rabbits and browsing animals. My observations include established plantings of all these species (other than māpou) on Mount Iron near Wānaka and at Queensberry, sites not dissimilar from the Rocky Point/Bendigo Hills Estate area.

[49] I do not have confidence that lowland ribbonwood, narrow-leaved lacebark and māpou would grow well in very shallow and rocky soils, as these species require deeper soils and are more sensitive to microsite conditions. These species were therefore not included in proposed cushionfield offset plantings at Pylon Flat. The other four species were also only included as a very minor component of the plantings at Pylon Flat.

[50] The inclusion of species in appropriate soil and landscape settings that would have formerly been notable components of the local vegetation, but that are now locally extinct and/or very rare at Rocky Point, increases plant and habitat diversity and complexity and as such provides valuable additional ecological benefits.

[51] The proposed plantings include five species listed as 'At Risk' in the latest threat classification for vascular plants: *Olearia lineata* (At Risk Declining), *Olearia odorata* (At Risk-Declining), fierce lancewood (At Risk-Naturally Uncommon), *Coprosma virescens* (At Risk-Declining), and *Carmichaelia compacta* (At Risk-Declining).

Offset approach

[52] Two offset models were used, one based on effects on kānuka scrub-shrubland, and one based on effects on cushionfield dominated by *Raoulia australis*. The two models had different benchmarks, with the scrub-shrubland model incorporating an indigenous closed-canopy forest benchmark on deeper, moister soils, and the cushionfield model incorporating a shrubland benchmark on thinner, drier soil.

[53] As noted above, the cushionfield offsetting model anticipates replacement of *Raoulia australis* cushionfield with indigenous shrubland/woodland.

[54] Total areas for the offsets have been revised from those in the original Wildlands offset summary report. Revised offset sites and their areas are summarised in the below table. Refer to Appendices 1 and 2 for plans showing the revised offset sites.

Offset	Impact area (hectares)	Offset area (hectares)	Offset sites and areas (hectares)
Shrubland offset	1.74	2.10	Rocky Point - 0.58 Hemlock Gully – 1.52 (of 1.77 available)
Cushionfield offset	3.95	4.30	Pylon Flat – 1.53 Panorama rise – 1.26 Areas A-E – 1.51 (of 1.69 available)

Components and attributes

[55] Components in each model were constructed for indigenous cover, species richness, basal area, number of indigenous seedlings, and number of indigenous saplings. Basal area is a key component because at a plot level it increases continuously, whereas aspects of cover, species richness, and numbers of seedlings and saplings can increase or decrease depending on the stage of succession.

[56] For each component, several attributes were used. Importantly, there can be trade-offs between the condition of attributes within a component. For example, one species might increase condition more rapidly than others, and hence have a greater effect on the offset outcome.

[57] The offsetting outcome (net present biodiversity value of each component or NPBV) is derived by averaging the condition of the attributes within the component.

Offsetting outcomes

[58] The updated offsetting outcomes are summarised in Table 1 below. Outcomes for all components of the shrubland offset were net gains. All but one component of the cushionfield offset also achieved net gains. The negative component value for indigenous ground cover largely reflects successional processes (ground cover establishment is limited under a young woody canopy). A few individual attributes were negative, reflecting successional processes or the ‘dilution’ of kānuka by other

indigenous woody species. If only kānuka was planted, the offsetting outcomes for kānuka seedlings and saplings would be positive.

Table 1 – Summary of components and offset model outcomes for the shrubland and cushionfield offsets at Rocky Point.

Components	NPBV outcome	Notes
Shrubland offset		
Indigenous cover	0.01	A positive outcome for woody cover was achieved in ten years, while vine cover was achieved in 20 years. Ground cover was negative at 30 years, reflecting that a 30-year-old forest would cast deep shade, and colonisation by indigenous ground cover species will be slow.
Indigenous species richness	0.55	A positive outcome was achieved for each attribute. The endpoint was 30 years for each attribute.
Basal area	0.38	Positive outcomes were achieved for all attributes. The endpoint was 30 years for each attribute.
Number of seedlings	0.74	Kānuka cannot regenerate in deep shade, so had a negative NPBV outcome, which was outweighed by positive NPBV outcomes from the other six species. The endpoint was 30 years for each attribute.
Number of saplings	0.72	Kānuka cannot regenerate in deep shade, so had a negative NPBV outcome, which was outweighed by positive NPBV outcomes from the other six species. The endpoint was 30 years for each attribute.
Cushionfield offset		
Indigenous cover	-1.16	While indigenous woody cover was positive at 20 years, the cover of indigenous ground cover species, and rock and litter cover, were both negative at 30 years. This is because on thinner, drier soils growth rates of indigenous vegetation and ecological processes will be slower, and exotic ground cover will persist for longer.
Indigenous species richness	0.12	Total indigenous, indigenous woody, and vine species richness all had positive NPBV at 20 years. Indigenous ground cover species richness was negative at 30 years; this is because on thinner, drier soils growth rates of indigenous vegetation and ecological processes will be slower, and exotic ground cover will persist for longer.
Basal area	0.40	All species, had positive NPBV values at 30 years resulting in a positive NPBV at the component level.
Number of seedlings	0.31	All species other than kānuka had positive outcomes at 30 years.
Number of saplings	0.02	All species other than kānuka had positive outcomes at 30 years.

[59] Importantly, the key basal area component achieved a clear positive NPBV outcome in both shrubland and cushionfield offsetting models. The deeper, moister soils at the sites where the shrubland offset outcome will take place will not limit basal area accumulation.

[60] The offsetting outcomes therefore show that no net loss of indigenous biodiversity could be achieved through the proposed offset actions, as well as an overall net gain in indigenous biodiversity as required for offsets under the NPSIB

Response to Council ecological peer review matters relevant to offsetting and compensation

Relevance of climax vegetation

[61] Mr Harding considers that descriptions of the vegetation that would have occurred or is expected to occur (climax communities) at the project area are of limited relevance for assessment of the effects of the activity or for the design of a biodiversity offset (or compensation) proposal. This may be valid for assessment of effects but is not applicable with respect to designing an offset or compensation proposal. Such proposals seek a net gain in biodiversity values, which often requires consideration of aspects of the ecology of the project area that are not currently present but if present would be of high ecological value.

[62] Woody vegetation is the most depleted vegetation type in Central Otago, retaining only c.1.3% of its original extent across the whole non-alpine region.[3] Many of the species formally abundant in Central Otago are consequently now very uncommon or locally extinct. One of the highest ecological priorities in Central Otago is retaining the existing cover of woody vegetation and increasing its cover through ecological restoration.

[63] The importance of woody vegetation was also highlighted by Dr Matt McGlone in his conclusions regarding indigenous biodiversity priorities in the South Island high country[4], conclusions which remain just as relevant today as in 2004. He concluded that it is increasingly recognised that woody biomes offer marked benefits in terms of biotic diversity, pest and weed suppression, and soil structure and fertility. He also noted that birds in particular are limited by lack of woody vegetation in the region.

[3] Walker, S., Lee, W.G., and Rogers, G.M. (2003). The woody vegetation of Central Otago, New Zealand. *Science for Conservation*, 226:5-99.

[4] McGlone, M. (2004). *Vegetation history in the South Island high country*. Landcare Research contract Report LC0304/0654.

[64] While significance criteria in the NPSIB provide a useful means of classifying present-day ecological values, they in no way imply that vegetation communities no longer present are not of high or higher ecological significance. Significance criteria are also not mentioned in Appendix 3 of the NPSIB as factors requiring consideration in determining the appropriateness of a biodiversity offset.

[65] The use of diverse woody vegetation in the proposed offset is therefore appropriate. The development of several hectares of diverse woody vegetation would be of very high ecological value and would also rank very highly if assessed using the significance criteria in the NPSIB.

Loss of cushionfield

[66] Mr Harding notes that aerial images indicate widespread loss of kānuka-cushionfield vegetation through conversion to exotic grassland (pasture), viticulture, and rural residences (lifestyle blocks) in Central Otago. I agree with this analysis, and would add that succession to woody vegetation is another important component of this loss.

[67] The current proposal at Rocky Point provides one of the few examples of a development in the region in which robust biodiversity offsetting measures have been proposed. This avoids the continuation of the trend of lost indigenous biodiversity and habitat and in contrast provides a net gain in indigenous biodiversity which may not occur under alternative management regimes.

Appropriateness of offsetting species

[68] Concern has been expressed that “the appropriateness of the mix of species used for offsetting is uncertain due to a lack of information about what the ‘climax’ communities of the area would be. This may result in poor uptake of plants and a longer lag between the loss of biodiversity within the proposed development site and the accrual of benefits from the offset site.”

[69] The rationale for the species mix has been described earlier in my evidence. Nineteen of the 26 species are naturally occurring in the present-day environment, indicating their appropriateness. Their

successful persistence and natural regeneration where a seed source is available demonstrates their ability to tolerate the present-day conditions (abiotic and biotic). There is strong evidence that all these species also formed important components of the pre-settlement vegetation.

[70] The uncertainty in climax communities does not relate to the species that were present or their appropriateness for the present-day environment, but largely to how the species were arranged in the communities with respect to relative abundance.

[71] Offset sites were selected to encompass relatively sheltered areas and generally with deeper soils. Mr Beale has also outlined an ecological management regime for the offsets including protection from browse, early irrigation, and monitoring and replacement of dead plants for five years. I therefore consider it reasonable to assume, in the absence of unforeseen circumstances, that the plantings will show good uptake and achieve biodiversity outcomes within expected timeframes.

[72] The seven additional species in the proposed offset that are not known to currently exist naturally in the area are a relatively minor component of the plantings, and some are only included in the shrubland offset within more favourable soils. It is acknowledged that the outcomes for these species may be less certain. Micro-siting of these species during planting to ensure they are within the most favourable soils and sheltered positions will be important. If these species proved to be problematic, this would most likely emerge in the first one- or two-years following planting, and the regime proposed by Mr Beale would allow for their replacement with proven species such as kānuka and kōwhai with little effect on offset outcomes.

[73] Concern was also expressed that "the achievability and sustainability of the proposed biodiversity offset in a drought-prone and high fire-risk environment are uncertain." The offset is more achievable and certain using species that are less flammable than kānuka, which is highly flammable. Kāpuka, for example, is known to have very low flammability and its use has been proposed in 'fire smart' plantings on Mount Iron.

[74] The woody vegetation proposed in offsets will not have a higher flammability or fire risk than the existing kānuka-dominant scrub in the wider area. In fact, the more diverse species mix will be more resistant to fire, due to the inclusion of species such as kōwhai and kāpuka. The fire suppression measures proposed as part of the subdivision may result in fewer wildfires in the project area and Bendigo Hills Estate than in other areas lacking such measures.

[75] The biodiversity offset uses counts and measures, meaning the success of the plantings can be evaluated using the same metrics. As described above, basal area is an important attribute as it increases continuously and measurement of this alone would verify the progress of the plantings.

Appropriateness of the use of EIANZ Guidelines for effects assessment

[76] Mr Harding raises concerns regarding the use by Mr Beale of the EIANZ Guidelines, specifically mentioning the risk that ecological attributes (such as diversity and pattern) and fragmentation of the project area may not be adequately assessed.

[77] While I share Mr Harding's concerns on the potential limitations of the Guidelines, I also note that the EIANZ Guidelines are used widely by ecologists throughout Aotearoa New Zealand and are recognised as a legitimate tool by many local authorities and ecology peer reviewers commissioned by Councils.

[78] To overcome the limitations, it is essential that the ecologist applying the Guidelines is aware of the potential risks and applies a rigorous assessment that also incorporates factors including fragmentation that are not necessarily well captured by the Guidelines.

[79] In my opinion Mr Beale's application of the Guidelines to assess ecological values and ecological effects is thorough, and adequately captures effects such as fragmentation for which there is a risk that the Guidelines will overlook. I consider this is expressed in the high score assigned to the ecological context criterion for the kānuka shrubland-

scrub and cushionfield communities, and by the consideration given to fragmentation in applying the effects management hierarchy.

[80] The effects on the high values identified by Mr Beale for factors such as ecological context, including fragmentation, were important aspects that Wildlands considered in developing the biodiversity offset framework. A key criterion for selecting offset sites was their ability to increase landscape-level connectivity and ecological integrity outside of the Rocky Point development zone.

Alignment of the proposed biodiversity offsets with offsetting principles

[81] I have set out in the following table my responses to the relevant issues raised by Mr Harding and Mr Vincent in relation to the alignment of the proposed biodiversity offset with the relevant offsetting principles in Appendix 3 of the NPSIB, along with my additional analysis where relevant.

Review of the Proposed Biodiversity Offset against Principles for Biodiversity Offsetting (Appendix 3 of NPSIB)	
1. Adherence to effects management hierarchy	
A biodiversity offset is a commitment to redress more than minor residual adverse effects and should be contemplated only after steps to avoid, minimise, and remedy adverse effects are demonstrated to have been sequentially exhausted.	Mr Beale's evidence outlines the steps taken to avoid, minimise, and remedy adverse effects, and the progression to the proposed biodiversity offset is the next step anticipated in the effects management hierarchy.
2. When biodiversity offsetting is not appropriate	
Biodiversity offsets are not appropriate in situations where indigenous biodiversity values cannot be offset to achieve a net gain. Examples of an offset not being appropriate include where: (a) residual adverse effects cannot be offset because of the irreplaceability or vulnerability of the indigenous biodiversity affected: (b) effects on indigenous biodiversity are uncertain, unknown, or little understood, but potential effects are significantly adverse or irreversible: (c) there are no technically feasible options by which to secure gains within an acceptable timeframe.	**A.** Threat ranking of a species alone is not a sufficient basis on which to conclude that the vulnerability of the indigenous biodiversity precludes a development; the assessment also needs to consider what the effects of the proposal are on those values. In the case of the project area, Mr Beale's evidence has shown that effects on vulnerable species can be effectively mitigated and offset. I do not consider that any of the species have a vulnerability such that adverse effects must be avoided by absolute retention of all individuals of those species, or that offsetting is precluded. I understand irreplaceability to refer to the extent to which an affected area would need to be protected if the values it holds are to be maintained. Irreplaceability is therefore not simply a reference to an area's Threatened Environment Classification. Successional kānuka-cushionfield vegetation in similar environments to that in the development area is present over the majority of Rocky Point. It is also present in large parts of the adjoining

	Bendigo Hills Estate, Bendigo Scenic Reserve, and Bendigo Historic Reserve, as well as other nearby privately owned properties. Similar vegetation and habitats are also present further afield in the Upper Clutha Basin, notably around Queensberry, Luggate, and Mount Iron Scenic Reserve/Recreation Reserve. These areas also contain populations of the associated at risk and threatened species including spring annuals and *Raoulia* spp.. I therefore do not consider that the irreplaceability of the vegetation and habitat in the development zone is sufficiently high that effects on its values need to be avoided. The plantings that are part of the offsetting actions will ultimately have higher irreplaceability than any current vegetation. I am therefore satisfied that the irreplaceability and vulnerability of the indigenous biodiversity affected are not sufficiently high to exclude offsetting as a legitimate way of dealing with the residual effects. **B.** The effects of the proposal on indigenous biodiversity are certain, known and well understood, as outlined in the evidence of Mr Beale. This gives confidence in applying the effects management hierarchy to deal with adverse effects, and allays concerns around potential irreversible effects. **C.** The planting of indigenous woody vegetation at offset sites provides a technically feasible approach to dealing with the residual effects of the project. The offset models show that 'no net loss' and 'net gain' outcomes can be obtained within a 30-year timeframe.

3. Net gain	
This principle reflects a standard of acceptability for demonstrating, and then achieving, a net gain in indigenous biodiversity values. Net gain is demonstrated by a like-for-like quantitative loss/gain calculation of the following, and is achieved when the indigenous biodiversity values at the offset site are equivalent to or exceed those being lost at the impact site: (a) types of indigenous biodiversity, including when indigenous species depend on introduced species for their persistence; and (b) amount; and (c) condition (structure and quality).	**A.** The types of indigenous biodiversity affected by the proposed development are contained within the ecological complex of kānuka-*Raoulia australis* vegetation and habitats described in Mr Beale's evidence. This complex comprises a mosaic of early successional indigenous vegetation that is progressing towards mature scrub-forest. The ecological complex occurs within a relatively uniform ecosystem type, which would have been covered in woody vegetation prior to human settlement. The proposed offset establishes areas of woody indigenous vegetation that are consistent with the ecological complex and provide habitat suitable for the types of indigenous biodiversity associated with the ecosystem type. The offsetting approach replaces early successional vegetation with more mature stages of vegetation, thus short cutting the development of more complex woody vegetation with greater biodiversity values. This is consistent with a like for like calculation with respect to types of indigenous biodiversity. Vegetation composition within any one location of an ecosystem type is transitory and frequently very diverse at any point in time, reflecting many natural and human-induced factors, whereas ecosystem types are defined by abiotic factors and are relatively stable/fixed. For this reason, climax/mature vegetation communities within a given ecosystem type provide a reliable and meaningful benchmark for determining appropriate like for like offset parameters for types of indigenous biodiversity. Without this there is a risk that offsets will simply replicate an existing vegetation community that is atypical, successional, or transient in the landscape. This

	is especially important given the long-term nature of offsets. A like for like offset in terms of types of indigenous biodiversity must ensure that the impacted and offset biodiversity are of the same ecosystem type. A comprehensive understanding of the ecology of the project area is therefore required to inform an offset, and this requires consideration not only of the present-day aspects of indigenous vegetation and habitats, but also of the ecological history and successional trends of the site. Without the temporal information, the long-term vision for ecological management is unlikely to see beyond what exists at the current moment in time and will therefore potentially be ineffective at fostering restoration and facilitating vegetation development to a state of indigenous biodiversity that is more complex and provides diverse habitat for indigenous fauna. The concept of restoration itself implies progress towards an idealised or 'climax' state of biodiversity. I therefore consider that an understanding of potential natural ecosystems and successional processes in the project area is critical to ecological management in general, and specifically to informing a biodiversity offset that is appropriate to the site and provides a strong long-term outcome for biodiversity. Because of this, I disagree with Mr Harding that descriptions of the vegetation that would have occurred or is expected to occur (climax communities) at the project area are of limited relevance for the design of a biodiversity offset proposal. I consider that these factors are vital components in offset design.

	The Wildlands report provides clear evidence that the cushionfields at the project area were induced by previous land management practises and are being replaced by naturally regenerating woody vegetation. The natural ecosystem type in the Rocky Point/Bendigo area is a woody dryland forest, and as described in the Wildlands report. On this basis, replacing impacted cushionfield with indigenous woody vegetation is consistent with a like for like biodiversity offset for 'types of indigenous biodiversity'. This approach also makes good ecological sense, as it allows for offsets to restore more complex, mature communities. For these same reasons I also consider it is appropriate to include species in an offset that are not present in the impacted vegetation but that are a known part of the historic vegetation community, and to replace non-woody vegetation with structurally more diverse woody vegetation when in the same ecosystem type. Restricting species to what is currently present at the impact zone or project area does not make ecological sense to me, and limits the potential for biodiversity gains. Well-constructed biodiversity offsets should be able to achieve net gains in species diversity and structural diversity, and this is consistent with the overarching purpose of the NPSIB to ensure an overall net gain in indigenous biodiversity. The biodiversity accounting model outputs show that the offset actions will result in positive basal area and species diversity outcomes. Basal area is the most indicative measure of the progressive development of forest/shrubland ecosystems. The condition of the cushionfield plant

	communities will be improved through control of invasive weeds such as hemlock and stonecrop. **B.** The proposed offset actions cover 6.4 hectares, compared to 5.69 hectares of impacted indigenous vegetation and habitats. **C.** Mr Harding considers that the proposed offset does not provide a like-for-like gain in the condition (structure and quality) of the indigenous biodiversity present at the project area, because the proposed activity will fragment the remaining vegetation/habitat with roads and residential sections. However, all of the proposed offset sites provide increased connectivity between existing indigenous vegetation/habitats, and will also improve the buffering of the northern margin of Bendigo Scenic Reserve. I consider this adequate to meet this requirement. Mr Harding also does not consider that the condition (structure and quality) of the indigenous biodiversity values at the offset site "are equivalent to or exceed those being lost at the impact site". However, the offset models developed for the proposed biodiversity offset show that 'no net loss' and 'net gain' outcomes can be achieved for the key measures of condition, including basal area, species richness and structural complexity (as measured by vegetation tiers). This indicates that the requirements around condition (structure and quality) are met.

	This principle should not be used to maintain the current vegetation as a 'museum piece', when it is clearly successional and would become more complex if current pressures ceased and seed sources were available.
4. Additionality	
A biodiversity offset achieves gains in indigenous biodiversity above and beyond gains that would have occurred in the absence of the offset, such as gains that are additional to any minimisation and remediation undertaken in relation to the adverse effects of the activity.	The proposed offset will lead to biodiversity gains associated with 6.4 hectares of additional indigenous vegetation and habitats. These gains would not otherwise have occurred through other proposed effects management measures.
5. Leakage	
Biodiversity offset design and implementation avoids displacing harm to other indigenous biodiversity in the same or any other location.	I agree that some areas of the original Pylon Flat offset site have "indigenous vegetation" that would be displaced by woody vegetation plantings, a fact that was not adequately addressed in the original reports. The area to which this applies has now been removed from the offset site, and additional areas have been added nearby of equivalent size and landscape context value. These areas are shown as Areas A-E in Appendix 1.
6. Long term outcomes	
A biodiversity offset is managed to secure outcomes of the activity that last at least as long as the impacts, and preferably in perpetuity. Consideration must be given to	I have reviewed the offset management regime proposed by Mr Beale, and consider that this provides assurance that the outcomes will be secured in the long term.

long-term issues around funding, location, management and monitoring.	In response to the concerns raised around uncertainty in the timeline for increase in biodiversity in the offset areas, I consider that the measures proposed by Mr Beale are sufficient to ensure the offset outcomes are reached within 30 years. The monitoring and annual reporting requirements as specified in the EEMP will be subject to consent conditions to ensure that the plants are eco-sourced, are of a suitable grade and that weed control and aftercare management measures achieve the performance metrics set out in the EEMP, as outlined in Mr Beale's evidence. Achieving these metrics will ensure the offset plantings will become self-sustaining. The EEMP also provides scope for adaptive management should any aspects of the offsets not be performing satisfactorily, as outlined in Mr Beale's evidence. Because the offset models are based on counts and measures (and are thus verifiable), if the progress is inconsistent with the offset the ecologist will be able to suggest contingency actions to ensure positive outcomes.
7. Landscape context	
Biodiversity offsetting is undertaken where this will result in the best ecological outcome, preferably close to the impact site or within the same ecological district. The action considers the landscape context of both the impact site and the offset site, taking into account interactions between species, habitats and ecosystems, spatial connections, and ecosystem function.	Landscape context was a primary factor taken into consideration when selecting offset sites, as outlined in my evidence. All offset sites are either within or very close to the project area. The offset sites enhance spatial connections between existing indigenous vegetation and reduce fragmentation, and introduce plant species that are presently at low abundance or absent from the project area. Offset sites encompass a range of soil types and landscape positions including hillslopes, gullies and terraces. An ephemeral seepage is also included in the part of the Hemlock Gully site, and plantings will enhance this important ecological

	feature. Considering these factors, it is my opinion than the combined offset locations will result in the best ecological outcome possible.
8. Timelags	
The delay between loss of, or effects on, indigenous biodiversity values at the impact site and the gain or maturity of indigenous biodiversity at the offset site is minimised so that the calculated gains are achieved within the consent period or, as appropriate, a longer period (but not more than 35 years).	The offset models show that the proposed indigenous woody vegetation plantings will achieve the indigenous biodiversity gains within 30 years. I do not consider that there is an alternative offsetting approach that could achieve gains in a shorter time period.

[82] Based on the analysis in the above table, I am satisfied that the proposed offsetting is appropriate when considered in terms of the offsetting principles of the NPSIB.

[83] The proposed offset is also consistent with the definition of 'biodiversity offset' in the NPSIB. Specifically, the offset has been applied to residual adverse effects following sequential application of avoidance, minimisation, and remediation measures, and achieves a net gain in type, amount and condition of indigenous biodiversity as discussed in the above table.

[84] I also consider that the overall indigenous biodiversity outcome of the proposed effects management regime, combined with the additional positive ecological effects outlined in Mr Beale's evidence, is consistent with the overarching objective of the NPSIB, to "maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity after the commencement date." In the medium to long term, it will also achieve net positive ecological and biodiversity outcomes compared to if the proposed project was not undertaken.

[85] The Otago Regional Policy Statement 2019 includes in Policy 5.4.6 an outline of when it is appropriate to consider biodiversity offsetting. This sets out one additional matter that is not in the NPSIB:

> *"c. The offset ensures there is no loss of individuals of Threatened taxa other than kānuka (*Kunzea robusta *and* Kunzea serotina*), and no reasonably measurable loss within the ecological district to an At Risk-Declining taxon, other than mānuka (*Leptospermum scoparium*), under the New Zealand Threat Classification System ("NZTCS")."*

[86] Individuals of *Myosotis brevis* (Threatened-Nationally Vulnerable) were found in Rocky Point, as shown on the Baxter Design Plan and described in Mr Beale's evidence. These individuals were all within a seasonally damp south facing area bordering a stand of mature kānuka, which is consistent with understanding of the habitat requirements of this species. No individuals were found within the development area, despite

the comprehensive searches undertaken in this area by Mr Beale and Mr Simpson.

[87] Many individuals of *Raoulia australis* (At Risk-Declining) would be removed from the development area under the proposed development. As described in the Wildlands succession report, the aerial fly over conducted on 5 December 2023 revealed that low elevation cushionfields with a high proportion of indigenous *Raoulia australis* remain extensive within the Dunstan Ecological District. In particular, large areas of cushionfield are present between 200-700 metres elevation on the western and northern flanks of the Dunstan Range. An estimated 168.9 hectares of dense cushionfield was mapped within five kilometres of Rocky Point. A large population of *Raoulia australis* is also present over very extensive areas in which *Raoulia australis* is a secondary but important component of the vegetation, including large areas of kānuka shrubland. This indicates that the Dunstan Ecological District supports a very large population of *Raoulia australis*.

[88] The 3.95 hectares of cushionfield affected by the proposed development at Rocky Point represents 2.3% of the dense cushionfields in the Dunstan Ecological District. The 1.74 hectares of kānuka shrubland at Rocky Point affected represents at most 0.17% of similar habitat (this upper limit is based on most of the c.1,000 hectares in the Bendigo Scenic and Historic Reserves containing this vegetation type, but all other similar vegetation areas in the Ecological District having not been considered in the calculation).

[89] On this basis, I suggest that the proposed development could result in a reduction in the population of *Raoulia australis* in the Dunstan Ecological District of somewhere between 0.1-1.5%. I do not consider that this is a 'reasonably measurable loss' of *Raoulia australis* within the Dunstan Ecological District. The population reduction would not adversely affect the range or viability of this species, or result in the worsening of the conservation status of *Raoulia australis* nationally or in the Ecological District. In terms of the criteria for describing magnitude of effect outlined in Table 8 of the EIANZ Guidelines, I consider that this would correspond to "Negligible" (having negligible effect on the known

population or range of the species). Further, it would also be reasonable to surmise that parts of the Dunstan Ecological District carry high populations of rabbits that are not currently controlled, creating suitable conditions for expansion of *Raoulia australis* populations in these areas.

[90] The 'annotated decisions version' of the proposed Otago Regional Policy Statement 2021 (currently under appeal) sets out two further matters for determining when offsetting is not appropriate:

(e) the likely worsening of the conservation status of any indigenous biodiversity as listed under the New Zealand Threat Classification System (Townsend et al, 2008), and

(f) the removal or loss of health and resilience of a naturally uncommon ecosystem type that is associated with indigenous vegetation or habitat of indigenous fauna.

[91] As noted above, and discussed in my evidence and Mr Beale's evidence, the proposed development will not worsen the conservation status of any indigenous flora. The evidence of Ms King also shows that this scenario will not occur for herpetofauna.

[92] Saline ecosystems are the only naturally uncommon ecosystem type at Rocky Point, and they are associated with indigenous vegetation. No areas of saline ecosystems will be removed by the development. The management measure proposed by Mr Beale for these areas (removal of exotic pest plants) is considered sufficient to ensure that the health and resilience of the areas of saline ecosystems and their associated indigenous vegetation is retained.

Conclusion

[93] Rocky Point is in the early transitional stages of indigenous vegetation recovery following years of severe human-induced degradation of soils and vegetation, including fire and introduction of browsing mammals. This process involves succession from predominantly non-woody vegetation such as cushionfields to woody vegetation dominated by kānuka.

[94] Pre-settlement vegetation at Rocky Point comprised forest and scrub communities across almost the entire site, except for cushionfield-herbfield communities on localised areas of saline soils and persistence of shrubland, including porcupine shrub and cushion plants, on postglacial stony terrace escarpments. Closed canopy forest would have been present on areas of deep soils (gullies and toeslopes), grading into scrub on thin soils in shaded sites, and low growing shrubland on north facing slopes with thin soils.

[95] Small remnants of indigenous forest surveyed in the wider area have formed a closed kōwhai canopy approximately 10 metres tall, with a diverse shrub layer, and provide valuable examples of the type of forest communities that can develop in the lower western flanks of the Dunstan Range.

[96] A biodiversity offset developed for Rocky Point, to account for impacts to kānuka scrub-shrubland and cushionfield, involves planting 6.4 hectares of woody vegetation communities at sites at Rocky Point and Bendigo Hills Estate.

[97] The mix of species suggested for the proposed offset is appropriate, being primarily based on 19 species that are found today in the wider area and that were also key components of pre-settlement vegetation. This gives confidence in achieving the outcomes of the offset within anticipated timeframes.

[98] The offsetting outcomes show that no net loss of indigenous biodiversity can be achieved through the proposed offset actions, and 'net gain' consistent with the definition and principle in Appendix 3 of the NPSIB.

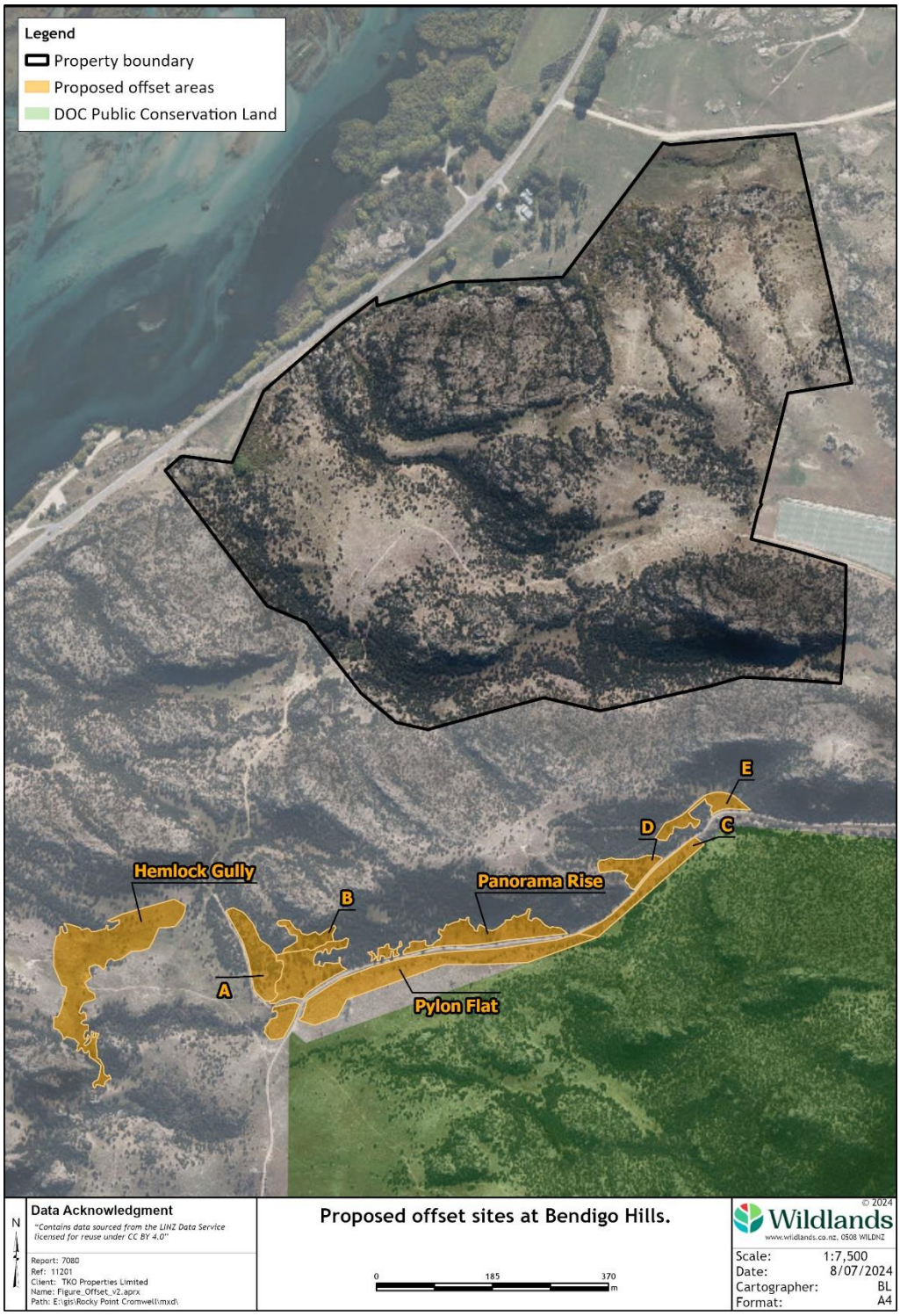
[99] The proposed offsetting is appropriate when considered in terms of the definition of a biodiversity offset in the NPSIB, the offsetting principles of the NPSIB, and the offsetting criteria in the current and proposed versions of the Otago Regional Policy Statement. It is also consistent with the overall objective of the NPSIB of no overall loss in indigenous biodiversity.

[100] Furthermore, I consider that these net gains in indigenous biodiversity would be important long-term benefits for the ecology of the area that would not occur in a scenario where Rocky Point remains under a farming regime.

Andrew Peter Wells

04 November 2024

Appendix 1. Proposed offset sites at Bendigo Hills Estate.



Appendix 2. Proposed offset sites at Rocky Point.