MATAKANUI

GOLD LIMITED

Biodiversity Outcome Monitoring Plan

June 2026

Citation: Alliance Ecology Ltd and Habitat NZ Ltd (2026). Bendigo-Ophir Gold Project Biodiversity Outcome Monitoring Plan.

DOCUMENT CONTROL

Revision	Authors	Organisation	Date	Approved
V1	M Baber	Alliance Ecology	07/08/2025	
V2	M Baber and Keith Barber (invertebrates only)	Alliance Ecology and Habitat New Zealand	05/09/2025	
V3	M Baber and Keith Barber (invertebrates only)	Alliance Ecology and Habitat New Zealand	02/10/2025	C Low
V4	M Baber and Keith Barber (invertebrates and survey design only)	Alliance Ecology and Habitat New Zealand	22 June 2026	

Disclaimer

This report has been prepared by Alliance Ecology Ltd for Matakanui Gold Limited. If used by other parties, no warranty or representation is given as to its accuracy and no liability is accepted for loss or damage arising directly or indirectly from reliance on the information in it.

The authors of this report acknowledges that this report will be relied on by a Panel appointed under the Fast Track Approvals Act 2024 and these disclaimers do not prevent that reliance.

Glossary

Specific terms	
ACO	Artificial Cover Objects
ARA	Ardgour Restoration Area
ARP	Ardgour Restoration Plan
BOGP	Bendigo-Ophir Gold Project ('the Project')
BOMP	Biodiversity Outcome Monitoring Plan
DDF	Direct disturbance footprint
ESA	Ecological Study Area
LERMP	Landscape and Ecological Rehabilitation Management Plan
LMP	Lizard Management Plan
MRZ	Mine Regeneration Zone
SEQE	Suitably Experienced and Qualified Ecologist(s)
TIMP	Terrestrial Invertebrate Management Plan
General terms	
Biodiversity	The variety of life on Earth at all its levels, from genes to ecosystems, and can encompass the evolutionary, ecological, and cultural processes that sustain life
Ecology	The study of the relationships between living organisms, including humans, and their physical environment.
Habitat clearance	Earthworks and/or vegetation clearance
Site description	
Ardgour Sanctuary	An area of Ardgour Station, north-northwest of the DDF, in which 38 ha of pest exclusion fencing is proposed
Ardgour Rise	A realignment of part of Thomson Gorge Road, via Ardgour Station (Ardgour Rise), planned to provide public access through to the Manuherikia Valley
Bendigo Sanctuary	An area of Bendigo Station, west of the DDF (and north of Bendigo Historic Reserve), in which 29 ha of pest exclusion fencing is proposed
Matakanui Sanctuary	Collectively the Ardgour and Bendigo Sanctuaries, comprising approximately 67 ha of pest-exclusion fenced areas.

1. INTRODUCTION

Plan objective, purpose and scope

The objective of this Biodiversity Outcome Monitoring Plan (**BOMP**) is to verify that stated ecological outcomes have been achieved within 35 years and to inform adaptive management or contingency measures where required. The purpose of this BOMP is to set out the methods for achieving this objective.

Verification of these stated biodiversity outcomes will be determined via monitoring the response of biodiversity metrics to proposed rehabilitation and offsetting/ compensation measures that are intended to address adverse effects that cannot otherwise be avoided or minimised. The biodiversity outcome monitoring in this BOMP is thus distinct from compliance monitoring, which demonstrates that effects management has been undertaken in accordance with conditions and associated management plans.

The biodiversity outcome monitoring programme involves the monitoring of habitat types and associated species within ecological rehabilitation and offset/compensation sites, and their response to rehabilitation and offset/compensation actions.

Biodiversity outcomes relating to the success of salvage and relocation operations (effects minimisation) are not addressed in this plan. Specifically:

- The outcomes of plant salvage and relocation efforts into the ecological rehabilitation sites are set out in the Landscape and Ecological Rehabilitation Plan (**LERMP**).
- The outcomes of invertebrate and lizard salvaging and relocation operations are addressed in the Terrestrial Invertebrate (**TIMP**) and Lizard Management Plans (**LMP**) respectively. We note that the success of salvage and relocation operations for lizards requires the ability to distinguish relocated individuals from resident individuals, and approval would be required to permanently mark individuals.

Translocated species monitoring is factored into this plan but dependent on approval of specific translocation applications and may need to be adapted to align with the monitoring requirements set out in the associated translocation conditions.

This BOMP is one of a suite of ecological management plans developed to give effect to the proposed ecology conditions. The other plans, and their relationship to this monitoring programme, are:

- **Habitat Impact Management Plan (HIMP):** describes measures to avoid or minimise adverse effects on wetland and terrestrial vegetation, including salvage of soils, vegetation and habitat features, and acts as a central reference linking the other plans.
- **Avifauna Management Plan (AMP):** details measures to avoid or minimise effects on indigenous birds, particularly by avoiding nesting sites.
- **Lizard Management Plan (LMP):** details measures to avoid or minimise effects on indigenous lizards through salvage and relocation.
- **Terrestrial Invertebrate Management Plan (TIMP):** details measures to avoid or minimise effects on indigenous terrestrial invertebrates.
- **Landscape and Ecological Rehabilitation Management Plan (LERMP):** details measures to rehabilitate, offset or compensate for adverse effects, including wetland hydrology, native revegetation and enrichment planting, vegetation and habitat transfer, livestock management, weed management and mammalian pest control.
- **Ardgour Restoration Area Management Plan (ARAMP):** details habitat restoration in the ca. 1,263 ha ARA, including terrestrial and wetland revegetation, livestock and weed management, rock stacks and rubble pits, and mammalian pest control. Its 35-year outcomes are tracked through the Tier 2 monitoring in this BOMP.
- **Matakanui Sanctuary Management Plan (MSMP):** details construction and management of the Ardgour and Bendigo Sanctuaries, including pest elimination, incursion surveillance and response, browser and weed management, habitat deployment and fence maintenance.
- **Mammalian Pest Management Plan (MPMP):** details mammalian pest control across rehabilitation and offset/compensation sites.
- **Biosecurity and Plant Pest Management Plan (BPPMP):** details biosecurity-risk and weed management across rehabilitation and offset/compensation sites.
- **Applied Research Plan for Cushionfields and Spring Annuals (ARP):** details applied research to improve ecological outcomes for these values, informing adaptive management for cushionfield and spring-annual outcomes.

Table 1 below provides a summary of biodiversity outcome requirements, associated consent conditions and applicable management plans.

[Placeholder: Additional conditions relating to the application of mātauranga Māori and exercise of kaitiakitanga.]

Table 1: Biodiversity outcome requirements, associated consent conditions and relevant management plans.

Condition No.	Consent condition(s)	Primary management plan (s)
C93	The Consent Holder must implement the Biodiversity Outcome Monitoring Plan (BOMP) certified as part of the approval of the BOGP pursuant to Section 81 of the Fast-track Approvals Act 2024 (or as amended in accordance with relevant conditions), and which forms part of the consents. The objective of the BOMP is to provide for monitoring and reporting against biodiversity objectives and outcomes stated in consent conditions for terrestrial and wetland ecology, and to inform adaptive management or contingency measures where required.	
C94	To achieve the objective set out in Condition C93 above, the BOMP must include, as a minimum: a. Biodiversity outcome monitoring objectives and monitoring study area; b. Biodiversity outcome metrics and targets (for both rehabilitation sites and offset/compensation sites); c. Terrestrial biodiversity monitoring and wetland biodiversity monitoring programme, including: (i) baseline monitoring methods for determining existing biodiversity state; and (ii) Methods for monitoring biodiversity values to quantify response to	

<table>
<tr><th>Condition No.</th><th>Consent condition(s)</th><th>Primary management plan (s)</th></tr>
<tr><td></td><td>ecological rehabilitation and compensation actions.

d. Biodiversity outcome monitoring and reporting requirements; and

Adaptive management or contingency measures required to ensure that stated biodiversity outcomes are achieved within the life of consent (35 years).</td><td></td></tr>
<tr><td>C95</td><td>The BOMP required under Condition C93 [above] must also include the specific limits and standards described below which must be complied with.

The BOMP must include the biodiversity outcomes within the DDF (Rehabilitation) described below.

Rehabilitation Targets within the DDF (within 35 years of the commencement of the consents)

<table>
<tr><th>Ecological value</th><th>Target description</th><th>Target value (within DDF)</th></tr>
<tr><td>Native vegetation</td><td>Native habitat coverage</td><td>At least 70% of the DDF having a native vegetation / habitat mosaic dominated by indigenous</td></tr>
</table>
</td><td></td></tr>
</table>

Condition No.	Consent condition(s)			Primary management plan (s)
			woody shrubland and tussock with lesser amounts of cushionfield, taramea, and marsh and swamp wetland habitats.	
		Mean native plant species richness	An increase of >50% mean native plant species richness relative to the pre-mining state.	
		Threatened/At-Risk plants	An increase in mean nationally or regionally Threatened or At-Risk plant species richness and combined relative	

Condition No.	Consent condition(s)			Primary management plan (s)
			abundance relative to baseline condition within the DDF.	
		Mean avifauna species richness	An increase in mean abundance of seed dispersing native avifauna relative to baseline condition within the DDF.	
	Lizards	Mean lizard abundance for Kawarau gecko, tussock skink and McCann's skink	Lizard abundance will achieve the baseline condition for each species listed here, within the DDF.	

Condition No.	Consent condition(s)	Primary management plan (s)
	Advice Note: Baseline values are as per the baseline monitoring report required under Condition 103 (below). The BOMP must include the following biodiversity outcomes outside the DDF (Offsetting and Compensation): a. A net increase in vegetation and fauna values that exceeds residual loss shall occur within 35 years of commencement of impact across 2,219 ha of offset/compensation sites, being: (i) 889 ha of Mine Regeneration Zones adjacent to the DDF (Plan 3 in Attachment 1 in **Schedule One**); (ii) 1,263 ha Ardgour Restoration Area (Plan 3 in Attachment 1 in **Schedule One**); (iii) 38 ha Ardgour Sanctuary (Plan 3 in Attachment 1 in **Schedule One**); (iv) 29 ha Bendigo Sanctuary (Plan 3 in Attachment 1 in **Schedule One**); And must achieve net positive / net gain outcomes for the values and species listed in Condition 118 (further below in consent). b. The metrics used to monitor the net increase in vegetation/fauna values shall include the following:	

Condition No.	Consent condition(s)	Primary management plan (s)
	(i) Areal extent of native-dominated vegetation/habitat cover across offset/compensation areas; (ii) Mean species richness of native tree, shrub and liana species; (iii) Mean indigenous dominance of plants; (iv) Presence of naturally dispersed native woody vegetation species excluding matagouri, tree daisy and mingimingi; (v) Mean species richness and combined abundance of the nationally/regionally Threatened plant assemblages; (vi) Mean abundance of seed dispersing native birds; and (vii) Mean abundance of Kawerau gecko and McCann's skinks. Additionally, the following biodiversity outcomes are sought for the Ardgour and Bendigo Sanctuaries: c. The Consent Holder must use best endeavours to enhance native biodiversity in the landscape via the translocation of nationally or regionally Threatened or At-Risk species that have been locally extirpated, including:	

Condition No.	Consent condition(s)	Primary management plan (s)
	(i) Three lizard species (for example Otago skink, jewelled gecko and grand skink); (ii) One invertebrate species (for example *Sigaus minutus* (minute grasshopper), or *Sigaus childi* (Otago aridgrasshopper); and One plant species (for example *Ranunculus brevis,* white sedge, *Carmichaelia nana*, or tussock bindweed (*Convolvulus verecundus subsp. Verecundus*)) or species listed in the LERMP Appendix E.	
C96	The Consent Holder must ensure that integrated terrestrial biodiversity monitoring stations are selected in accordance with the protocol in the BOMP, using a stratified random approach to ensure representative spatial cover and adequate replication across the ecological rehabilitation and offset/compensation sites. The biodiversity reporting requirements in Condition 104 (below) will include the following monitoring: a. Baseline monitoring (Year 0) data collection at all terrestrial and wetland monitoring sites, which must commence in the spring/summer prior to the commencement of compensation actions in each offset/compensation area (with the exception of baseline lizard monitoring in the Ardgour Restoration Area, where baseline monitoring must commence	

Condition No.	Consent condition(s)	Primary management plan (s)
	within 6 months of commencement of pest control measures in the area (which may be required to commence sooner due to seasonality requirements, prior to the 12-month bed-in time requirement for artificial cover objects (ACOs) to use in lizard monitoring)); b. A baseline monitoring report must be produced which includes: (i) Verification that the baseline monitoring programme has been undertaken in accordance with this condition and relevant requirements and methods set out in the BOMP; (ii) Baseline monitoring results including statistics, maps and representative photos; (iii) Recommendations for improving the monitoring programme (if required); c. Monitoring undertaken at monitoring stations on 5-year rotational cycles (each year, one-fifth of the monitoring stations will be monitored) commencing once rehabilitation or offset/compensation actions commence at each site, and continuing for the 35-year life consent or earlier if the stated biodiversity outcomes have been verified(with separate targeted spring annual surveys at least 5 yearly at	

Condition No.	Consent condition(s)	Primary management plan (s)
	suitable times of the year once the ARP has concluded); and d. Final monitoring at year 35. Within 60 days of the completion of baseline (Year 0 and 1) monitoring, the Consent Holder must submit a pre-impact baseline monitoring report to Council. This report must be prepared by an SEQE and must contain interim targets (with reference to the biodiversity outcomes listed in this condition above) for those monitoring biodiversity indicators set out in the certified BOMP, which must include: e. Vegetation classification; f. Indigenous vegetation species richness; g. Native ecosystem structure for shrubland and tussock systems; h. Seedling and sapling density; i. Herbaceous cover; j. Native avifauna species composition and number and location from monitoring station; k. Lizard species presence; l. Wetland vegetation composition, indigenous dominance and relative abundance; and Wetland bird presence (only within swamp/marsh wetland complex to be created as part of the DDF rehabilitation).	

Condition No.	Consent condition(s)	Primary management plan (s)
C97	Annual Biodiversity Outcome Monitoring Reports will be provided to Central Otago District Council as part of the Annual Ecological Monitoring Report required under Condition C12. The report must include: a. Verification that biodiversity outcome monitoring was completed in accordance with Condition 102 and Condition 103 above and the methods set out in the certified BOMP; b. Monitoring results including analysis against baseline conditions, and relevant maps and representative photos; c. Recommendations for any adaptive management measures if interim results suggest that progress is unlikely to meet stated year 35 outcomes stated in Condition 118); and Any recommendations to improve the monitoring programme.	
	Should interim results from the biodiversity outcome monitoring reports required in Condition 104 (directly above) indicate that stated biodiversity outcomes in Condition 102 are unlikely to be achieved, adaptive management options must be developed and implemented to ensure the 35-year outcomes will be achieved.	

Condition No.	Consent condition(s)	Primary management plan (s)
	The location, scale, intensity, frequency, location and duration of the proposed adaptive management measure(s) must be commensurate with requirements for achieving the stated biodiversity outcomes within the stated timeframe (35 years).	
C98	At year 35, a final Biodiversity Outcome Monitoring Compliance Report must be submitted to Central Otago District Council to confirm completion of the biodiversity outcome monitoring programme. This report must include, but not be limited to: a. Verification that the monitoring has been undertaken in accordance with relevant Condition 103 and Condition 104 and the methods set out in the certified BOMP; b. Monitoring results and analysis against baseline conditions, including relevant maps and representative photos; and c. Verification that outcomes for wetland and terrestrial biodiversity values affected by the project activities stated in Condition 105 (above) and net positive / net gain outcomes stated in Condition 118 (further below) have been achieved. Should the final biodiversity outcome report provided in Year 35 indicate that outcomes stated in Condition 118 have not been achieved despite implementation of adaptive measures, contingency management and	

Condition No.	Consent condition(s)	Primary management plan (s)
	associated monitoring measures will be required to be developed, including the type, quantum and location of contingency measures and associated monitoring requirements.	
Species Reintroduction		
C99	The objective of species re-introductions is to improve the ecological integrity of ecological rehabilitation and offset and compensation sites and to facilitate the recovery of nationally and regionally Threatened species that have been extirpated from the local landscape, ecological district or region.	
C100	The details of any species translocations undertaken, including any adaptive management and contingency measures and associated monitoring, must be provided in the Annual Ecological Monitoring Report as part of the Annual Monitoring and Compliance Report required by Condition C12 in the Common Conditions in **Schedule One**. This report must include, but not be limited to: a. The fauna species considered by the project ecologist as being potentially ecologically feasible for re-location, as identified in the Assessment of Ecological Effects prepared by Alliance Ecology Limited (Alliance Ecology (2025));	

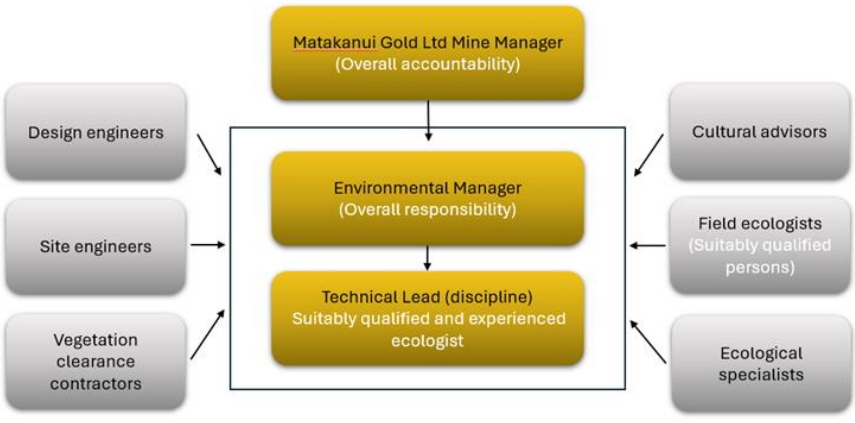
Condition No.	Consent condition(s)	Primary management plan (s)
	b. A description of consultation undertaken in the prior 12 months with [iwi] and the Department of Conservation regarding potential species re-locations; c. A summary of any comments received from the parties listed in (b) above, in conjunction with any updates to relevant management plans; d. Any ecological feasibility assessments undertaken for potential species re-locations, together with commentary on how recommendations from the parties in (b) above have been actioned, and for those recommendations not adopted, the reasons why; e. For any proposed species translocations: i) Confirmation that the Consent Holder has obtained the necessary property rights to use the release sites and any permits required under the *Wildlife Act 1953* and that the certified management plans are consistent with these; and ii) A description of the monitoring and reporting to be undertaken for the duration of the consent. A summary of any species translocations undertaken and associated monitoring must be provided in the final (year 35) offsetting and compensation report.	

Condition No.	Consent condition(s)	Primary management plan (s)
	Advice Note: species re-introductions depend on securing viable source populations and approval of translocation applications for fauna protected under the Wildlife Act.	

2. ROLES AND RESPONSIBILITIES

Delivery of, and compliance with, the suite of ecological management plans is the responsibility of the Environment Manager, who liaises with the Mine Manager, Suitably Experienced and Qualified Ecologist(s) (SEQE). The Environment Manager holds overall accountability for implementation of and compliance with all ecology management plans, including this BOMP.

Matakanui Gold Ltd will maintain ultimate responsibility for the project while delegating operational authority to the Environmental Manager. This governance approach balances professional management with expert guidance, ensuring both practical implementation and technical excellence in achieving the project's ecological and restoration objectives.



3. PROJECT AND ECOLOGICAL CONTEXT

The following sections summarise the project, its ecological values, the effects of the project, and the proposed effects management. This context is drawn from the

Assessment of Ecological Effects (AEcE) report and is reproduced here so that this BOMP provides the necessary context to be read as a stand-alone document.

3.1. Project overview

Matakanui Gold Limited (MGL) proposes to establish the Bendigo-Ophir Gold Project (BOGP), comprising a new gold mine, ancillary facilities and environmental mitigation measures on Bendigo and Ardgour Stations in the Dunstan Ranges of Central Otago, approximately 20 km north of Cromwell. Four gold deposits - Rise and Shine (RAS), Come in Time (CIT), Srex (SRX) and Srex East (SRE) - are to be mined by open pit methods, with underground mining of the deeper RAS orebody in later years. The total maximum potential disturbance, referred to as the Direct Disturbance Footprint (DDF) and including contingency, Ardgour Rise and predator-proof fencing, is approximately 610 ha.

Ecological works include rehabilitation of disturbed areas within the DDF and ecological uplift and pest-exclusion areas on adjacent land at Ardgour and Bendigo Stations. The principal ecological management areas addressed by this monitoring programme are the ecological rehabilitation areas within the DDF, the approximately 889 ha Mine Regeneration Zone (MRZ), the approximately 1,263 ha Ardgour Restoration Area (ARA), and approximately 67 ha of pest-free sanctuaries (the 38 ha Ardgour Sanctuary and the 29 ha Bendigo Sanctuary).

3.2. Ecological characteristics and values

The DDF and surrounding landscape, described in detail in the AEcE, support a mosaic of seven broad terrestrial vegetation communities: exotic pasture or herbfield; mixed depleted herbfield (cushionfield) and grassland; mixed tussock shrubland and exotic grassland; mixed scrubland; native-dominant tussockland; native taramea herbfield and shrubland; and native dominant scrubland. Wetland habitats include swamps and marshes, gully fens and hillside seeps.

The area supports a diverse indigenous flora, including at least 58 Threatened or At Risk vascular plant species, and indigenous birds, lizards and invertebrates that include nationally or regionally Threatened or At Risk species. These include at least 10 bird species (such as the Threatened karearea/eastern falcon and the At Risk pihoihoi/New Zealand pipit), two nationally At Risk lizard species (Kawarau gecko and tussock skink), and 18 notable invertebrate species (including four nationally Threatened moth species and four newly identified species). Although the landscape includes areas of high ecological value, it remains heavily modified by past and current land use, invasive weeds, and introduced mammalian predators and browsers.

3.3. Effects on terrestrial and wetland ecology

Following the implementation of measures to avoid or minimise adverse effects, the project is expected to result in the loss of up to 610 ha of indigenous and exotic vegetation and associated habitat. This includes up to 187 ha of mixed tussock shrubland and exotic grassland; 124 ha of mixed scrubland; 104 ha of mixed depleted herbfield and grassland (a large component of which is cushionfield); 79 ha of exotic pasture or herbfield; 25 ha of native-dominant tussockland; 2 ha of native herbfield and shrubland; 86 ha of native dominant scrubland; and 3.1 ha of natural inland wetlands (2.42 ha of swamp and marsh, 0.84 ha of fen, and 0.19 ha of seepage wetlands).

The actual and potential impacts described in the AEcE include vegetation and habitat loss through clearance, soil stripping and earthworks; habitat edge effects and degradation; habitat fragmentation and loss of connectivity; loss of or harm to species; potential direct mortality of eastern falcon and electrocution risk for some birds; reduced wetland condition from altered surface and groundwater flows; sediment discharge to receiving environments; disturbance from noise, vibration, lighting and dust; and changes to vegetation communities arising from altered farming practices.

3.4. Effects management

A range of measures will be undertaken before and during construction and operations to avoid, minimise and remediate adverse effects. These include habitat clearance protocols (physical delineation of the footprint and erosion and sediment control), native bird nest surveys, the salvage and relocation of wetland and terrestrial plants, lizards and invertebrates, and the salvage and relocation of habitat features such as rock stacks, boulders, weathered boulders and coarse wood.

Within the DDF, ecological rehabilitation will occur across approximately 480 ha of landform that can feasibly be rehabilitated. This includes re-establishment of indigenous tussockland (222 ha), indigenous woody scrubland (230 ha), cushionfield (19 ha, with uncertain outcomes), taramea herbfield and shrubland (2 ha), swamp wetland with open-water elements (3.5 ha) and marsh wetland (4 ha); establishment of reproductively viable kowhai clusters; and deployment of rock piles (1 per ha) and rubble pits (minimum 1 per 5 ha), totalling approximately 1.5 ha, to provide habitat for lizards, invertebrates and threatened plants.

Residual effects that cannot be avoided, minimised or remediated will be offset or compensated to the extent practicable. The overarching objective for residual effects is to achieve, where possible, demonstrable benefits to indigenous terrestrial and wetland biodiversity that outweigh impacts within 35 years of approvals being granted. This is to be delivered through ecological restoration and habitat enhancement across 2,219 ha surrounding the mine footprint: the 889 ha MRZ (native enrichment planting, livestock

management, mammalian pest control and weed control); the 1,263 ha ARA (as for the MRZ); and approximately 67 ha of pest-free sanctuaries (predator-exclusion fencing, eradication of mammalian predators, browser management, weed control, habitat enhancement, and translocation of locally extirpated Threatened or At Risk species). Biodiversity outcome monitoring under this BOMP verifies that these stated outcomes are achieved and provides triggers and responses for adaptive management or contingency measures as required.

4. STATED BIODIVERSITY OUTCOMES AND ASSOCIATED TARGETS

In many instances, net gain or net positive biodiversity outcomes are expected through rehabilitation and offset/compensation actions undertaken across 2,699 ha as detailed in the associated management plans.

All outcomes including net loss outcomes will be verified through fit for purpose metrics where this is feasible. . In some instances, net loss or uncertain outcomes are predicted due to a lack of evidence to the contrary, however, net positive or net gain outcomes may eventuate and thus predicted net loss outcomes also warrant verification. In particular, through the implementation of the Applied Research Plan for Conservation Management, Rehabilitation and Expansion of Cushionfield (**ARP**), effects management options may prove successful and identify management opportunities that generate tangible benefits.

It is acknowledged that not all stated outcomes can be verified through the biodiversity outcome monitoring programme and this is reflected in both the metrics and outcome targets assigned. Verifying stated ecological outcomes with confidence is challenging for biodiversity values that are cryptic, naturally rare, or highly variable in their distribution and abundance, making detection and reliable measurement challenging. Moreover, ecological responses also tend to be influenced by numerous interacting and often confounding environmental drivers, which makes it difficult to attribute observed changes to the management measures themselves rather than to natural variation or external factors.

In broad terms metrics used to verify stated outcomes include:

- Habitat type extent (remote sensing)
- Indigenous plant dominance per unit area
- Indigenous plant species richness per unit area
- Occupancy % occurrence across replicates

- Relative abundance based on counts (plants and fauna) or percent cover (herbaceous plants)

Table 1 below sets out the expected outcomes for habitats and the metrics used to verify stated outcomes.

Table 1 expected outcomes for habitats and the metrics used to verify stated outcomes

Habitat type	Expected outcome following rehabilitation and offset/ compensation actions	Metrics used to verify stated outcomes
Exotic pasture or herbfield	Net loss (replaced by native habitat)	• Remote sensing (spatial extent) • Indigenous dominance • Mean indigenous plant species richness • % occurrence and relative abundance of notable plants
Mixed depleted herbfield (cushionfield) and grassland	Net loss (but with potential for tangible benefits if the ARPCSA provides evidence that these outcomes can be demonstrably achieved)	
Mixed tussock shrubland and exotic grassland	Net gain for native elements	
Mixed scrubland	Net gain for native elements	
Native-dominant tussockland	Net loss in extent and net gain in condition	
Native taramea herbfield and shrubland	Net gain in extent and condition	
Native-dominant scrubland	Net gain in extent and condition	
Alluvial podocarp forest	Net gain in extent and condition	
Swamp/Marsh wetlands	Net gain in extent and condition	
Fen wetlands	Net loss in extent and condition	
Seepage wetlands	Net loss in extent and condition	
Alluvial podocarp forest	Net gain in extent and condition	

Table 2 below sets out the expected outcomes for notable plant species and the metrics used to verify stated outcomes. Notable plant species include species classified as nationally or regionally threatened or at risk or otherwise assessed as having important ecological value.

Table 2 Notable plant species and the metrics used to verify stated outcomes.

Notable species (nationally or regionally threatened or otherwise deemed to be of moderate or higher ecological value)	Expected outcome following rehabilitation and offset/ compensation actions	Metrics used to verify stated outcomes
Tiny forget-me-not - *Myosotis brevis*	Net loss	• Occupancy (% occurrence across monitoring programme replicates) • Relative abundance (number of plants or % cover per unit area)
Carex talboti	Net loss	
Colobanthus brevisepalus	Net loss	
Raoulia beauverdii	Net loss	
Hypericum involutum	Net loss	
Desert poa - *Poa maniototo*	Net loss	
Ceratocephala pungens	Net loss	
Lagenophora barkeri	Net loss	
NZ Mousetail - *Myosurus minimus n-z*	Net loss	
Celadon mat daisy - *Raoulia parkii*	Net loss	
Rytidosperma maculatum	Net loss	
Epilobium hectorii	Uncertain	
Common scabweed - *Raoulia australis*	Net loss	
Rytidosperma buchananii	Net loss	
Colobanthus strictus	Net loss	
Feldmark grass - *Rytidosperma pumilum*	Net loss	
Pincushion grass - *Agrostis muscosa*	Net loss	
Poa lindsayi	Net loss	
Luzula leptophylla	Net loss	
Myosotis antarctica subsp. antarctica	Net loss	
Hot rock fern - *Pellaea calidirupium*	Net loss	
Myriophyllum pedunculatum ss novae-zelandiae	Net loss	
Rock fern - *Cheilanthes sieberi sieberi*	Uncertain	
Coastal woodrush - *Luzula banksiana var. rhadina*	Net loss	
Rytidosperma corinum	Net loss	
Vittadinia australis	Uncertain	
Kōwhai *Sophora microphylla*	Net positive	
Chaerophyllum ramosum	Uncertain	
Juncus distegus	Net positive	
Mikimiki - *Coprosma virescens*	Net positive	

Notable species (nationally or regionally threatened or otherwise deemed to be of moderate or higher ecological value)	Expected outcome following rehabilitation and offset/ compensation actions	Metrics used to verify stated outcomes
Blue Wheat Grass - *Anthosachne aprica*	Net positive	
Olearia lineata	Net positive	
Scented tree daisy *Olearia odorata*	Net positive	
Styphelia nana	Net positive	• Occupancy (% occurrence across monitoring programme replicates) • Relative abundance (number of plants or % cover per unit area)
Pimelea aridula aridula	Net positive	
Carex diandra	Net positive	
Bladder Fern - *Cystopteris tasmanica*	Net positive	
Festuca mathewsii subsp. mathewsii	Net positive	
Buchanan's Sedge - *Carex buchananii*	Net positive	
Geranium potentilloides	Net positive	
Rumex flexuosus	Net positive	
Bidibid / piripiri - *Acaena buchananii*	Net positive	
Spineless Acaena - *Acaena inermis*	Net positive	
Carex kaloides	Net positive	
Carmichaelia petrei	Net positive	
Geranium aff. microphyllum	Net positive	
Olearia bullata	Net positive	
Pimelia notia	Net positive	
Pimelea prostrata subsp. prostrata	Net positive	
Stout dwarf broom *Carmichaelia monroi*	Net Gain	
Coprosma brunnea	Net Gain	
Coral broom *Carmichaelia crassicaulis crassicaulis*	Net Gain	
Olearia cymbifolia	Net Gain	
Veronica rakaiensis	Net Gain	
Carmichaelia nana	Net gain	
tussock bindweed (Convolvulus verecundus subsp. Verecundus)	Net gain	

Table 3 below sets out the expected outcomes for notable fauna and the metrics used to verify stated outcomes. Notable fauna include species classified as nationally or

regionally threatened or at risk or otherwise assessed as having important ecological value.

Table 3 Notable fauna and the metrics used to verify stated outcomes.

Fauna species	Expected outcome at year 35 and target increase relative to baseline following rehabilitation and offset/ compensation actions	Metrics used to verify stated outcomes
Avifauna		
Indigenous Avifauna Species Richness	Net positive	Relative abundance / conspicuousness
Indigenous Avifauna Assemblage abundance	Net positive	
New Zealand falcon – eastern form	Net positive	
New Zealand pipit*	Net positive	
Silvereye*	Net positive	
Bellbird	Net positive	
Black-fronted tern	Uncertain	Not applicable (it is not proposed to monitor outcomes for these species as they are likely unaffected.
Black-billed gull	Uncertain	
South Island pied oystercatcher*	Uncertain	
Black shag	Uncertain	
Little shag	Uncertain	
Lizards		
Tussock skink	Net loss	Counts (relative abundance)
Kawarau gecko	Net loss	
McCanns skink	Net loss	
Otago skink (if translocation approval granted)	Net gain	
Grand skink (if translocation approval granted)	Net gain	
Jewelled gecko (if translocation approval granted)	Net gain	
Invertebrates		
Pseudocoremia cineracia (moth)	Uncertain	Counts (relative abundance)
Harpalus new sp. (ground beetle)	Uncertain	
Inophloeus new sp. (weevil)	Uncertain	
Phaulacridium otagoense (grasshopper)	Uncertain	

Fauna species	Expected outcome at year 35 and target increase relative to baseline following rehabilitation and offset/ compensation actions	Metrics used to verify stated outcomes
Elachista helonoma (moth)	Uncertain	
Ichneutica toroneura (moth)	Uncertain	
Megadromus new sp. 1 (ground beetle)	Uncertain	
Megadromus new sp. 2 (ground beetle)	Uncertain	
Scythris sp. 1 (moth)	Uncertain	
Sporophyla oenospora (moth)	Uncertain	
Homodotis sp. A (NZAC (CO)) (moth)	Uncertain	
Pasiphila sp. 'Olearia' pug moth	Uncertain	
Agrotis admirationis (moth)	Uncertain	Counts (relative abundance)
Asaphodes recta (moth)	Uncertain	
Nyctemera annulata (moth)	Uncertain	
Ichneutica sistens (moth)	Uncertain	
Meterana exquisite (moth)	Uncertain	
Paranotoreas fulva (moth)	Uncertain	

5. BIODIVERSITY OUTCOMES AND ASSOCIATED TARGETS

The outcomes below are derived from the AEcE, the LERMP, the ARAMP and the MSMPs. Assigned increase targets represent minimum requirements to demonstrate that stated outcomes have been met and also to ensure there is high probability of being able to meet those targets to avoid instances of non-compliance. The stated targets are set relative to baseline conditions in the DDF (rehabilitation targets) and in the offset/compensation sites (offset/compensation targets) prior to project activities.
Ecological rehabilitation sites

The following biodiversity outcomes and targets are sought in rehabilitation areas, with the objective of reducing the severity of project effects. Outcomes and associated percentage increase targets within 35 years of approvals being granted and relative to the DDF are:

- >70% of the 610 ha Direct Disturbance Footprint (**DDF**) is covered in a native vegetation/habitat mosaic that is dominated by indigenous woody shrubland and tussock with lesser amounts of cushionfield, taramea and marsh and swamp wetland habitats

- An increase in mean native plant species richness relative to the pre-mining state[1] for native tree, shrub and liana species across the habitats within the DDF relative to the pre-mining state;
- An increase in indigenous dominance of vegetation relative to the baseline
- An increase in mean Threatened or At Risk plant species richness and combined relative abundance relative to the pre-mining state across the habitats within the DDF; and
- An increase in mean abundance of seed dispersing native avifauna relative to the pre-mining state across the DDF

5.1. Biodiversity offset/compensation sites

The following biodiversity outcomes and targets are sought across 2,219 ha of biodiversity offset/compensation sites comprising the Mine Regeneration Zone (**MRZ)**, Ardgour Restoration Area (ARA), Ardgour Sanctuary and Bendigo Sanctuary:

- A net increase in vegetation and fauna values that exceeds residual loss for each of the following metrics within 35 years of granting of approvals based on:
  - Areal extent of native-dominated vegetation/habitat cover across offset/compensation areas;
  - Mean species richness of trees, shrubs and lianes;
  - Mean indigenous dominance of plants
  - Mean species richness and combined abundance of the nationally/ regionally threatened plant assemblage;
    - Establishment and persistence of re-introduced plants that are presently extirpated from the Ecological Study Area (**ESA**) and/or surrounding landscape as specified in the relevant plans.
    - Mean abundance of seed dispersing native birds; and
    - Mean indigenous avifauna species richness and assemblage abundance

Additionally, for the Ardgour and Bendigo Sanctuaries, the following biodiversity outcome is sought if consent applications to translocate the species noted below are approved by the Department of Conservation and Mana Whenua and/or other parties as required:

[1] Relative to the baseline state as quantified in the various survey reports and summarised in the assessment of ecological effects report

- An increase in native biodiversity in the landscape via the translocation of nationally or regionally Threatened or At Risk species that have been locally extirpated, including a minimum of:
  - Three lizard species (for example Otago skink, jewelled gecko and grand skink);
  - One invertebrate species (for example *Sigaus minutus* (minute grasshopper) or
  - *Sigaus childi* (Otago arid grasshopper)
  - One plant species (for example[2] *Ceratocephala pungens*, *Ranunculus brevis*, white sedge, *Carmichaelia nana*, or tussock bindweed (*Convolvulus verecundus* subsp. *Verecundus*)).

These biodiversity outcomes are expressed as measurable outcomes intended to be itemised, as a coherent and consistent set of performance measures, in the consent conditions. The methods by which the outcomes are achieved are detailed in this plan and the related management plans. Clear triggers and contingency actions to be implemented in the event that stated outcomes are not achieved are set out in Section X below

6. MONITORING PROGRAMME STUDY AREA

The monitoring programme will be undertaken across the ecological rehabilitation and offset/compensation areas before and after the commencement of effects management measures.. Baseline monitoring will include:

- Offset/compensation sites: Baseline monitoring prior to commencement of offset/compensation measures (yet to be completed). While existing information was captured as part of the assessment of ecological effects, replication was insufficient for biodiversity outcome monitoring.
- Direct disturbance footprint: Baseline information already collected from within 'DDF to inform the assessment of ecological effects report.

This baseline monitoring will enable 'before versus after' comparisons across 2,699 ha of available land that is proposed for ecological rehabilitation or offsetting/compensation. This includes monitoring within:

- The approximately 480 ha of ecological rehabilitation within the DDF (all available areas);
- The approximately 889 ha MRZ

[2] Establishment of spring annuals such as *C. pungens* will be in accordance with the outcomes of the ARPCSA

- The approximately 1,263 ha ARA
- The approximately 38 ha Ardgour Sanctuary
- The approximately 29 ha Bendigo Sanctuary

The sections below set out the design of the terrestrial biodiversity outcome monitoring programme and the data collection and analysis methods used to verify that stated outcomes have been achieved.

7. TERRESTRIAL BIODIVERSITY MONITORING

7.1. Study design

Integrated terrestrial biodiversity monitoring stations (herein monitoring stations) will be selected using a stratified random selection and deselection approach to ensure representative spatial cover and adequate replication across all habitat types in the ecological rehabilitation and offset/compensation sites.

Monitoring stations will be selected from grid centroids within a nested grid network covering the entire site. Grid sizes of 800m x 800m, 400m x 400m, 200m x 200m, or 100m x 100m will be applied depending on the areal extent of rehabilitation, offset/compensation area and the replication needs within each site or habitat type.

Regardless of the selected grid size, a single monitoring station will be assigned to the grid centroid. Where required, monitoring stations within the ecological rehabilitation sites or the respective offset/compensation sites will be randomly de-selected to match replication needs. Where the grid centroid is unsuitable for monitoring (e.g. excessively steep terrain) the monitoring station will be moved to the closest feasible position relative to the original site.

7.2. Data collection

7.2.1. Remote sensing

Remote sensing (multispectral or hyperspectral imagery) will be used to quantify temporary changes in native shrubland cover within ecological rehabilitation and offset/compensation sites. This data will need to be calibrated against ground measurements at integrated monitoring stations as set out below. Remote sensing will be undertaken at a fine scale and include baseline imagery prior to the commencement of rehabilitation and offset/compensation measures.

High-resolution vegetation mapping will be undertaken at the outset of the programme to establish the baseline extent of vegetation types, with appropriate ground-truthing. Defined protocols for determining the spatial extent of vegetation types - including the

imagery resolution, classification rules and ground-truthing approach - will be specified so that the extent metric can be assessed objectively and consistently between monitoring events.

7.2.2. Integrated terrestrial biodiversity monitoring stations

A total of 350 integrated terrestrial biodiversity monitoring stations will be established across the 2,699 ha of ecological rehabilitation and offset/compensation sites, including:

- 70 monitoring stations within a 200m x 200m grid network across the ecological rehabilitation sites within the DDF
- 102 monitoring stations within a 200m x 200m grid network across the MRZ
- 138 monitoring stations within a 200m x 200m grid network across the ARA
- 20 monitoring stations within a 100m x 100m grid network across the Ardgour Sanctuary
- 20 monitoring stations within a 100m x 100m grid network across the Bendigo Sanctuary

Each monitoring station will be rotationally monitored once every five years between February and March with data collected for all metrics within the same monitoring event.

Biodiversity metrics monitored at the integrated monitoring stations centre on terrestrial vegetation, terrestrial avifauna, lizards and invertebrates as set out below. Each monitoring station centres on a 10 m x 10 m vegetation plot.

7.2.3. Terrestrial vegetation monitoring

Terrestrial vegetation monitoring will be undertaken within each 10m x 10m plot to quantify vegetation characteristics and change within the ecological rehabilitation and offset/compensation sites before (baseline)[3] and after commencement of project activities.

Each 10 m x 10 m plot will be delineated with permanent stakes at the centre and four corners (NW, NE, SW and SE corners) and numbered. Permanent stakes will be H3 25 mm x 25 mm wooden stakes. The plot may be further subdivided into four 5 m x 5 m subplots using measuring tape to facilitate the recording of habitat and vegetation characteristic measurements. A GPS recording will be taken at the centre of each plot.

[3] Baseline monitoring within the DDF has been completed as noted in Section 3.

The data collection methods to verify stated effects management outcomes for terrestrial vegetation are set out in Table 4 below.

Table 4: Data collection methods for native terrestrial vegetation monitoring

Bioindicator	Method
Vegetation and habitat data collection	
Vegetation	Vegetation photo points with photographs taken from the centre of the plot on a NW, NE, SW and SE bearing. The plot will be centred by corner stakes.
Indigenous vegetation species richness	Composition of all large seedlings > 30cm; saplings; and trees > 2.5 cm Diameter at Breast Height (DBH) within 10 m x 10 m vegetation plots to obtain mean native species richness per plot.
Native tree basal area	Measurement of all native trees (> 2.5 cm DBH) within 10 m x 10 m vegetation plots to obtain a mean basal area per plot for each species
Seedling and sapling density	Sapling and large seedling (> 30 cm) density for each native species within 5 m x 5 m subplots to obtain a mean basal area per plot for each species
Herbaceous cover	% cover of herbaceous vegetation and ground habitat within four 2 m x 2 m subplots located in each corner of the 10m x 10m vegetation plot

7.2.4. Terrestrial bird monitoring

Five Minute Bird Counts (5MBC), Acoustic Recording Devices (ARDs) will be used to monitor Avifauna along with nesting success monitoring for falcon.

Five Minute Bird Counts

Five Minute Bird Counts (**5MBC**) will be undertaken in accordance with Hartley and Greene (2012), except only native species will be recorded. Distance sampling protocol will be used in accordance with Greene and Efford (2012[9]).

To this end, bird data collected for each observation during each 5MBC will include:

- Species composition and the number of individuals for each species recorded.
- Type of observation: aural, visual or both.
- Distance of observation from monitoring station (m)[10] [11] with distances of observations from observers classified into four bands: 0 – 19 m, 20 – 39 m, 40 – 99 m and >100 m.

Bird counts will be undertaken by the **SEQE** (suitably experienced and qualified ecologist(s)) after a quiet period of 5 minutes. Environmental conditions recorded prior to commencement will include:

- Temperature: cold (>5°c), cool, (6°c to 10°c), mild (11°c to 15°c), warm (16°c to 22°c), hot (>22°c).
- Weather: fine/sunny, moderate rain, overcast, partly cloudy, light rain, heavy rain
- Wind (Beaufort scale)
- Noise: no noise, low noise level, moderate noise level, high noise level.

In accordance with Hartley and Greene (2012) counts will not be undertaken during adverse conditions including heavy rain, cold (<5°c), excessive noise, or wind 5 or higher on the Beaufort scale.

Data will be collected utilising ArcGIS tools including Field Maps and Survey123 (ESRI, 2023).

7.2.5. Lizard monitoring

Lizard monitoring at integrated monitoring stations will include four double layer Artificial Cover Objects (**ACO**s) placed adjacent to all four corners of the monitoring station a minimum of 12 months prior to first check[4]. Monitoring at each station will include a 1/2 person hour of timed manual searching via the lifting of rocks or coarse wood, checking crevices with a torch, or visual observations of basking lizards.

7.2.6. Invertebrate monitoring

Terrestrial invertebrate monitoring at integrated monitoring stations will include wooden disc monitoring and manual searching for ground beetles, spiders, wētā and other invertebrates, along with live light trap monitoring for moths.

A wooden disc will be placed adjacent to each lizard ACO in each corner of the integrated monitoring station. Wooden discs will be approximately 40-60cm in diameter and a minimum of 7.5cm thick and will be placed with the flattest surface onto bare

[4] It is important to allow ample time for ACOs to bed in so that baseline results aren't confounded by inadequate time between ACO deployment and checks. Where offset/compensation actions are scheduled for Winter 2026 (e.g. pest control in the Ardgour Restoration Area in advance of lizard relocation), baseline lizard monitoring will be undertaken after offset/compensation actions. However, in such instances, lizard monitoring will be undertaken within six months of commencement of offset/compensation actions, before any notable changes can occur.

ground (removal of leaf litter if necessary). These will be checked by carefully lifting the disc, recording the number and type of each taxa/species seen between the underside of the wood and ground, then carefully placing the disc back to avoid squashing any invertebrates.

A 1 person hour of timed manual searching while be undertaken at each monitoring station via the lifting of rocks or coarse wood, or visual observations.

Light trap monitoring will be conducted at approximately one in every five stations. To ensure moths are surveyed each year the required number of monitoring stations with light trap monitoring will be as follows:

- 14 out of the 70 monitoring stations across the ecological rehabilitation sites within the DDF
- 21 out of the 102 monitoring stations across the MRZ
- 28 out of the 138 monitoring stations across the ARA
- 5 out of the 20 monitoring stations across the Ardgour Sanctuary
- 5 out of the 20 monitoring stations across the Bendigo Sanctuary

Short-duration live light trapping will be employed instead of overnight traps that kill moths, minimising long-term population impacts and protecting significant species present in the area. Live light trap monitoring will utilise a collection chamber system, largely following the setup used in the Bendigo-Ophir Gold Project (**BOGP**) Terrestrial Invertebrate Survey. This uses a bucket-style collection chamber equipped with an appropriate 8-watt UV A lamp, perspex vanes, and battery power source, with egg cartons positioned within the trap to provide suitable resting surfaces for captured moths.

This approach ensures that moths can be safely observed, identified, and released unharmed while still providing effective monitoring data for the survey.

Light traps will be set up before dark and remain active for 3 hours after dark. Photographs of each moth species will be taken and used for id of species that cannot be readily identified on site. Specimens may be collected if required to ensure accurate identification under the discretion suitably experienced entomologist/ecologist, with all other individuals released at the collection location after identification.

Light trapping results will provide a species list which is intended to monitor species presence, and the composition of species, in the area over time. This method is not ideal for a quantitative comparison of abundance as it balances the need for quality information and reduces unnecessary specimen collection.

Environmental data will be collected alongside each sampling event including temperature, humidity, precipitation and a description of wind levels.

7.2.7. Species translocation monitoring (Matakanui sanctuaries only)

Biodiversity outcome monitoring for translocated species will be undertaken in accordance with monitoring requirements set out in specific translocation applications (yet to be applied for).

8. WETLAND BIODIVERSITY MONITORING PROGRAMME

8.1. Programme design

As with the terrestrial monitoring programme, wetland monitoring sites will be selected using a stratified random approach to ensure representative spatial cover and adequate replication across wetlands within the ecological rehabilitation and offset/ compensation sites.

The wetland biodiversity monitoring programme will apply a 10m x 10m grid across all existing or created wetlands within the rehabilitation and offset/compensation sites.

A single 2m x 2m monitoring station will be assigned to each selected grid centroid, provided that the centroid is located within a wetland, as confirmed during ground-truthing. Plots will be randomly de-selected or selected to match the replication needs within each wetland.

8.2. Data collection

8.2.1. Remote sensing

Remote sensing (multispectral or hyperspectral imagery) will be used to quantify temporary changes in wetlands within ecological rehabilitation and offset/compensation sites. This data will need to be calibrated against ground measurements at integrated monitoring stations as set out below. As for terrestrial vegetation, remote sensing will be undertaken at a fine scale and include baseline imagery prior to the commencement of rehabilitation and offset/compensation measures.

8.2.2. Integrated wetland biodiversity monitoring stations

A total of 100 wetland biodiversity monitoring stations will be established across the approximately 13.6 ha of wetland ecological rehabilitation and offset/compensation sites, including:

- 60 monitoring stations within the 7.5 ha of vegetated wetlands that will be created in the ecological rehabilitation sites within the DDF (commencing immediately prior to rehabilitation within each area)
- 20 monitoring stations within the approx. 4.7 ha of wetland within the MRZs; 20 monitoring stations within the approx. 1.4 ha of wetland within the ARA

Wetland monitoring will not be conducted in the Ardgour or Bendigo sanctuaries as these areas contain no wetland habitats.

Each monitoring station will be rotationally monitored once every five years between February and March with data collected for all metrics within the same monitoring event.

Biodiversity metrics monitored at the integrated monitoring stations centre on wetland vegetation and, for the wetland rehabilitation in the DDF, wetland birds.

8.2.3. Wetland vegetation monitoring

Wetland vegetation monitoring will be undertaken to quantify characteristics and change within the impact, habitat restoration and reference sites before and after the commencement of project activities.

Each 2m x 2m plot will be delineated with a permanent stake placed at the southwest corner and numbered. Permanent stakes will be H3 25 mm x 25 mm wooden stakes. A GPS recording will be taken at the centre of the plot.

The data collection methods to verify stated effects management outcomes for wetland vegetation are set out in Table 5 below.

Table 5 Data collection methods for native wetland vegetation monitoring

Bioindicator	Method
Wetland vegetation and habitat data collection	
Wetland vegetation composition, indigenous dominance and relative abundance	Wetland vegetation photo points with photographs taken from the centre of the plot. The plot will be centred by corner stakes.
	Composition of all large seedlings > 30cm; saplings; and trees > 2.5 cm Diameter at Breast Height (DBH) within 2 m x 2 m vegetation plots to obtain mean native species richness per plot.
	Species composition and relative abundance (% cover) of herbaceous vegetation and ground habitat to obtain species richness and species relative abundance per 2m x 2m plot

Targeted wetland plant monitoring will also be undertaken as set out in the LERMP.

8.2.4. Wetland bird monitoring

Wetland birds will be monitored only within the swamp/marsh wetland complex to be created as part of the ecological rehabilitation of the DDF. No wetland habitat types within the offset/compensation sites are expected to support wetland birds.

Once wetlands have been re-created in the ecological rehabilitation area, wetland bird monitoring will include call-back monitoring for South Island mātātā (fernbird) coupled with 5MBC and ARD. The 5MBCwill be undertaken in accordance with Hartley and Greene (2012) and as described aboveSurveys will be undertaken in February/March of each year.

9. TIER 2 MONITORING - ARDGOUR RESTORATION AREA AND MRZ

The integrated biodiversity outcome monitoring programme described above (referred to here as the Tier 1 programme) is supplemented by the following Tier 2, outcome-based monitoring for the Ardgour Restoration Area (ARA) and the Mine Regeneration Zone (MRZ). Tier 2 monitoring adds to and complements the Tier 1 programme by tracking progress towards the specific 35-year outcome targets for each Land Management Unit set out in the Ardgour Restoration Area and MRZ Management Plan (ARAMP). Where methods overlap, Tier 2 monitoring draws on the same remote sensing, permanent monitoring stations and bird counts described in the Tier 1 programme, as cross-referenced below.

10. MONITORING AND REPORTING

10.1. Baseline monitoring and reporting

Within each of the offset/compensation sites (MRZ, ARA, Ardgour Sanctuary and Bendigo Sanctuary), baseline monitoring will begin in the spring/summer prior to the commencement of offset/compensation actions[5]. This will mean baseline monitoring within the MRZ, ARA and Bendigo Sanctuary will commence earlier than for the Ardgour Sanctuary which is not proposed for completion until 2028.

This baseline monitoring (Year 0) will involve data collection at all terrestrial and wetland monitoring sites for the purpose of providing robust quantitative information on

[5] The exception is that where offset/compensation actions are scheduled for Winter 2026 (e.g. pest control in the ARA in advance of lizard relocation), baseline lizard monitoring will be undertaken soon after offset/compensation actions

biodiversity characteristics and values prior to the commencement of project activities at the offset/compensation sites.

A baseline monitoring report will be provided that includes:

- Verification that the baseline monitoring programme has been undertaken in accordance with relevant requirements and methods set out in the BOMP or the most recent amended version;
- Baseline monitoring results including descriptive statistics, updated maps and representative photos; and
- Recommendations for improving the monitoring programme if required.

10.2. Biodiversity outcome monitoring and reporting

Outcome monitoring at rehabilitation and offset/compensation sites will follow a five-year rotational cycle, beginning once rehabilitation or offset/compensation actions commence at each site. Each year, one-fifth of the monitoring stations established at a particular site will be monitored.

The timing of outcome monitoring commencement following the initiation of ecological rehabilitation or offset/compensation measures will vary across the different ecological rehabilitation and offset/compensation sites.

Monitoring will continue for the life of consent (35 years) and/or until stated biodiversity outcomes have been verified. Monitoring is also anticipated to continue beyond 35 years for as long as ongoing ecological management - including plant and animal pest control and management of the fenced sanctuaries - continues, consistent with the agreed need for secure long-term protection, enduring funding and management in perpetuity to maintain the biodiversity gains achieved.

Annual biodiversity outcome monitoring reports will be provided as part of the integrated annual ecology report and will be provided to the relevant Consent Authorities. The monitoring programme will be reviewed every five years. These reports will include:

- Verification that the monitoring has been undertaken in accordance with relevant consent conditions and the methods set out in the BOMP or the most recent amended version;
- Monitoring results including descriptive and statistical analyses of changes relative to the baseline for each of the metrics set out above. Results shall include updated maps and representative photos;
- Recommendations for adaptive management if interim results suggest that the rehabilitation and offset/compensation programmes are not on-track to achieve stated outcomes at 35 years. This may include recommendation on

the type, quantum and location of contingency measures to ensure that stated outcomes are achieved at 35 years; and

- Recommendations for improving the monitoring programme if required.

10.3. Biodiversity outcome report

Upon completion of the monitoring programme and 35 years after commencement of project activities, a final biodiversity outcome report will be submitted to Council. This report shall include:

- Verification that the monitoring has been undertaken in accordance with relevant consent conditions and the methods set out in the BOMP or the most recent amended version.
- Monitoring results including descriptive and statistical analyses of changes relative to the baseline, with updated maps and representative photos.
- Verification that stated biodiversity outcomes have been achieved, and/or recommendations for contingency measures if required, including the type, quantum and location of contingency measures and associated monitoring requirements.

Should interim results from the biodiversity outcome monitoring reports indicate that stated biodiversity outcomes are unlikely to be achieved, adaptive management options will be considered. The location, scale, intensity, frequency, location and duration of the proposed adaptive management measure(s) to be considered will be commensurate with requirements for achieving stated biodiversity outcomes within the stated timeframe.

Should the final biodiversity outcome report provided in year 35 indicate that stated outcomes have not been achieved despite implementation of adaptive management measures, contingency management and associated monitoring measures will be required. The location, scale, intensity, frequency, location and duration of the proposed contingency measure(s) will be determined at that time, commensurate with the stated outcome(s) that have not been achieved.

11. ADAPTIVE MANAGEMENT AND CONTINGENCY ACTIONS

This section sets out the adaptive management and contingency framework that applies where biodiversity outcome monitoring indicates that stated outcomes are not tracking as predicted. It provides the structured process by which underperformance is detected, investigated and corrected, and the range of contingency actions available, so as to provide a high level of confidence that the stated biodiversity outcomes will ultimately be achieved within the 35-year timeframe. It expands on, and is to be read

with, the monitoring and reporting provisions above and the relevant management plans.

11.1. Principles

Adaptive management is applied as an iterative, evidence-based process: monitor, evaluate against the stated outcomes and interim performance measures, and adjust management where required. The framework is designed to be proportionate (the scale and intensity of any response is commensurate with the magnitude of the shortfall), timely (action is taken at the earliest reliable indication of underperformance rather than awaiting year 35), and transparent (triggers, decisions and actions are documented and reported to the Consent Authorities).

11.2. Performance trajectories and triggers

Each stated biodiversity outcome has an associated 35-year target and a corresponding set of interim performance measures that describe the trajectory expected at five-yearly monitoring intervals. Interim performance trajectories will be established from the baseline (Year 0) monitoring and expressed as the level of each metric expected at Years 5, 10, 15, 20, 25 and 30 in order to remain on track to meet the 35-year target. These trajectories provide the benchmark against which each five-yearly monitoring result is assessed.

A trigger is reached where a monitored metric falls below its expected interim trajectory at a scheduled monitoring event, shows a statistically significant declining trend, or fails to show the rate of improvement required to meet the 35-year target. Two trigger levels apply:

- **Alert trigger -** a metric is below its expected interim trajectory, but the 35-year target remains achievable on current trends. This prompts investigation and, where warranted, refinement of management.
- **Action trigger -** a metric is materially below its expected interim trajectory, is in significant decline, or the 35-year target is unlikely to be met on current trends. This prompts implementation of adaptive management and, if necessary, contingency actions.

11.3. Adaptive management process

Where a trigger is reached, the following steps will be undertaken by the SEQE, with oversight by the Environment Manager and review by the BAG:

- **Investigation.** Investigate the likely cause(s) of the shortfall, drawing on the monitoring data, environmental data (e.g. climate and rainfall), records of management inputs (planting, and pest and weed control), and, where

relevant, targeted diagnostic monitoring (for example rodent monitoring where lizard or bird metrics decline).

- **Diagnosis and options.** Determine whether the shortfall reflects a management deficiency, an external driver (e.g. drought or pest irruption), a methodological issue, or natural variation, and identify the management options available to address it.
- **Response.** Adjust management in proportion to the shortfall. Adjustments may include increasing the intensity, frequency or spatial extent of existing actions, or introducing additional actions (see below).
- **Re-monitoring and review.** Monitor the response and its effectiveness and review the outcome at the next scheduled monitoring event, or sooner where the action trigger has been reached,
- **Escalation.** Where adaptive management does not return the metric to its expected trajectory, implement contingency actions.

11.4. Adaptive management actions by management lever

The actions available are drawn from, and implemented through, the relevant management plans (the LERMP, ARAMP, MSMP, MPMP, BPPMP, AMP, LMP, TIMP and ARP). Indicative actions, organised by management lever, include:

- **Revegetation and planting -** replanting or infill planting of failed areas; adjusting the species mix, eco-sourcing, plant grade or planting season; improving site preparation (topsoil and root-zone placement, ripping, mulching); plant protection (shelter, shade or rabbit guards); and irrigation or hydrogel use during establishment in dry conditions.
- **Threatened plant and cushionfield outcomes -** additional propagation and (re)introduction of target species; application of the findings of the Applied Research Plan for cushionfields and spring annuals; and protection and enhancement of source populations.
- **Weed control -** increased frequency or coverage of weed control; targeted control of species suppressing native establishment; and revised methods where weeds are limiting outcomes.
- **Mammalian pest and browser control -** increased trapping or toxin effort; additional rabbit and hare control; mouse monitoring and response where mesopredator or seed-predation impacts are indicated; and review of fence integrity and incursion response in the sanctuaries.
- **Avifauna -** adjustment of predator control to favour seed-dispersing and other target species; supplementary habitat provision; and review of monitoring methods (including automated/acoustic recording devices) where detection is limiting.

- **Lizards and invertebrates -** enhancement or addition of rock stacks, rubble pits and coarse woody habitat; and, where appropriate and approved by the relevant authorities, augmentation of populations within rehabilitated or fenced areas as a form of adaptive management.
- **Wetlands -** review and adjustment of wetland hydrology and water supply, planting and weed control to establish and sustain wetland condition.

11.5. Contingency actions

Contingency actions are implemented where adaptive management has not returned, or is not expected to return, an outcome to its required trajectory. Contingency actions are more substantial interventions and may include significant re-establishment or re-design of rehabilitation areas; provision of replacement habitat or additional offset or compensation area; intensified or extended management beyond that originally proposed; and, for outcomes that prove unachievable in their original form, the identification of alternative but ecologically equivalent outcomes in consultation with Consent Authorities. The location, scale, intensity, frequency and duration of any contingency measure, and its associated monitoring, will be commensurate with the stated outcome(s) not achieved.

Where interim monitoring indicates that a stated outcome is unlikely to be achieved, contingency planning will commence at that time rather than awaiting the year-35 report, so that there is sufficient time within the consent period to deliver the outcome. Should the final biodiversity outcome report at year 35 indicate that a stated outcome has not been achieved despite adaptive management, contingency management and associated monitoring will be required, determined at that time and commensurate with the outcome(s) not achieved.

11.6. Governance, reporting and timeframes

Triggers reached, investigations undertaken, and adaptive management and contingency actions implemented will be documented in the annual biodiversity outcome monitoring reports provided to Consent Authorities, together with an assessment of their effectiveness.