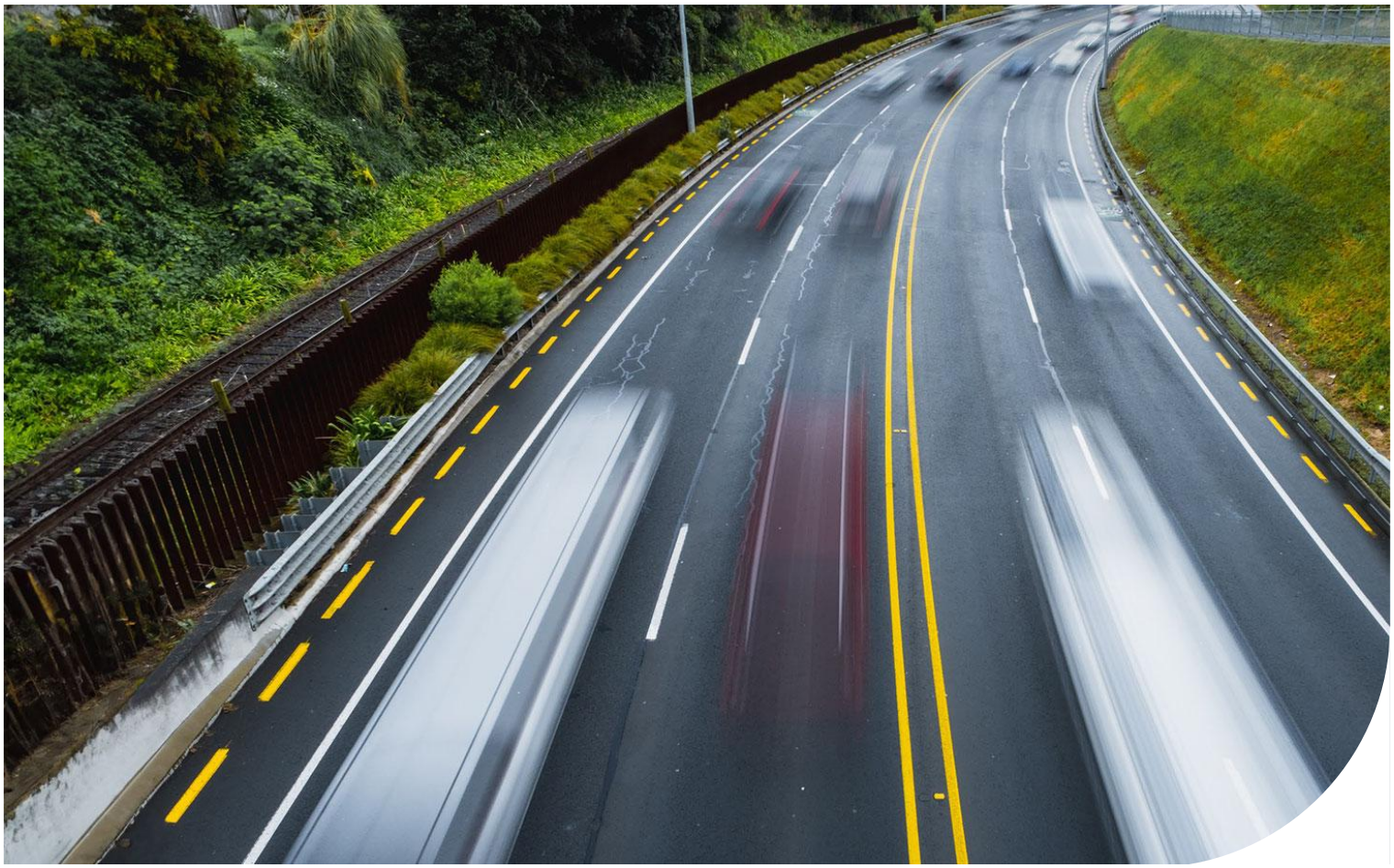

Assessment of Effects on Terrestrial Ecology

Alternative to the Brynderwyn Hills – Brynderwyn Hills section

2 April 2026

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Glossary of Acronyms and Abbreviations

The glossary of acronym and abbreviation tables in Volumes A and B of the Substantive Application apply to this report and should be referred to in addition to the acronyms and abbreviations below.

Abbreviation / Acronym	Term
ABM (s)	Acoustic bat monitors (s)
ACOs	Artificial Cover Objects
ALAN	Artificial Light at Night
BOAM	Biodiversity Offset Accounting Model
BRP	Bat Roost Protocol
DBH	Diameter at Breast Height
DOC	Department of Conservation
eDNA	Environmental DNA
EIANZ	Environment Institute of Australia and New Zealand
EMP	Ecological Management Plan
MHS	Manual Habitat Searches
NZES	New Zealand Ecological Society
NZTA	New Zealand Transport Agency Waka Kotahi
ONL	Outstanding Natural Landscape
PNAP	Protected Natural Areas Programme
RMA	Resource Management Act 1991
SNA	Significant Nature Area
WAA	Wildlife Act 1953 Authorisation
WSP	WSP New Zealand Limited
ZOI	Zone of Influence

Glossary of Defined Terms

The glossary of defined terms tables in Volumes A and B of the Substantive Application apply to this report and should be referred to in addition to the defined terms below.

Term	Meaning
Arboreal	Living in trees
Artificial Cover Object (ACO)	Standardised artificial refugia deployed to attract and detect cryptic lizard species
Avoidance	Measures taken to avoid impacts by not undertaking a proposed activity or changing the location, timing, frequency of the activity (BBOP, 2012). They are measures taken to avoid creating impacts from the outset (DOC, 2014).
Biodiversity Compensation	A conservation outcome that meets the requirements in Appendix 4 of the National Policy Statement for Indigenous Biodiversity and results from actions that are intended to compensate for any more than minor residual adverse effects on indigenous biodiversity after all appropriate avoidance, minimisation, remediation, and biodiversity offsetting measures have been sequentially applied.
Cryptic	Flora or fauna that are difficult to detect, observe, or survey for. Reasons for crypsis may include factors such as excellent camouflage (e.g. lizards, frogs), nocturnality (e.g. lizards, bats, frogs), periodic reduced activity levels (e.g. lizards, bats).
Ground Truthing	Verifying desktop assessments with observations and assessment through visiting sites.
Habitat	The area or environment where an organism or ecological community lives or occurs naturally for some or all of its life cycle, or as part of its seasonal feeding or breeding pattern; but does not include built structures or an area or environment where an organism is present only fleetingly.
Hop-over	Tall vegetation planted on both sides of a road/railway with overhanging branches that create a continuous canopy over the gap. The aim is to guide bats across roads/railways at a safe height above traffic.
Mammalian Pest Control	Wildlife management specifically aimed at reducing mammalian predator populations in order to influence their impacts on other species or ecosystems.
Mitigation	'Mitigate' is to alleviate, or to abate, or to moderate the severity of something (Roper-Lindsay et al. 2018). For the purposes of this report, it is a catch-all term for avoidance, minimisation, and remediation measures.
Nocturnal	Active at night.
Release Site	Site where salvaged and translocated lizards, frogs, or snails will be moved to if captured during construction of the Project.
Remediation	Measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/or minimised (DOC 2014).
Residual Effects	Effects remaining post-mitigation
Species	A group of living organisms consisting of similar individuals capable of freely exchanging genes or interbreeding, including subspecies, varieties and organisms that are indeterminate.
Terrestrial	Land-based.
Zone of Influence (ZOI)	The areas/resources that may be affected by the biophysical changes caused by the proposed project and associated activities (Source: EIANZ EcIA Guidelines)

1. Introduction

1.1. Purpose and scope of this report

This report provides an assessment of the actual and potential effects on terrestrial ecology, including vegetation, lizards, frogs, bats and invertebrates associated with the construction and operation of the Brynderwyn Hills section of the Alternative to the Brynderwyn Hills project (the Project).

This assessment forms part of a suite of technical assessments prepared for New Zealand Transport Agency Waka Kotahi (NZTA) to inform the Substantive Application under the Fast-track Approvals Act 2024 (FTAA) for the Project. This report should be read in conjunction with Volume A of the Substantive Application.

The scope of this assessment includes a description of the methodology applied in preparing the assessment, determination of the actual and potential effects generated by the Project, and details of the proposed measures to manage and mitigate adverse effects.

1.2. Qualifications and Experience

1.2.1. Simon Chapman: Technical Lead

I am an ecologist, employed by WSP New Zealand Limited (WSP) in the role of Technical Director – Ecology, a role I have held since January 2025.

I hold a BSc degree and a Post-graduate Diploma in Applied Ecology. I have approximately 25 years' experience as a full-time professional ecologist and I am a member of the New Zealand Ecological Society (NZES), the Environment Institute of Australia and New Zealand (EIANZ) and the Society for Research on Amphibians and Reptiles in New Zealand.

My recent experience relevant to this Application includes:

- **SH1 Cambridge to Piarere (2021 - 2025):** Subject Matter Expert for terrestrial fauna, including fieldwork, Ecological Impact Assessment, ecological management plan preparation/review, and expert evidence for the Fast-track application. Provided expert ecology inputs for multi-criteria analysis workshops and led Residual Effects modelling and Wildlife Act 1953 (Wildlife Act) authorisation.
- **Auckland Regional Landfill Peer Review (ARL Dome Valley) (2020 - 2025):** Auckland Council's terrestrial ecology reviewer for the Council and Environment Court hearings, including comprehensive peer reviews of Ecological Impacts Assessments, effects management proposals, expert witness caucusing, and the preparation and presentation of expert evidence.
- **Te Ara Pekapeka Bridge and Peacockes Transport Network (2018 - 2024):** Project Ecologist initially responsible for ecological planning, design and procurement inputs, followed by construction-phase ecological management implementation. The role also included ecological inputs for Multi Criteria Assessment workshops bridge design to minimise ecological impacts.
- **Central Interceptor (2012 - 2024):** Fauna Subject Matter Expert for the Ecological Impact Assessment Ecological and Project Ecologist for the construction phase. Peer-reviewed the Ecological Management Plan for the project and oversaw the design and implementation of management programmes for indigenous flora and fauna.

I have been involved with the Northland Corridor – Alternative to the Brynderwyn Hills project since November 2024. My knowledge of the ecological values along the Proposed Designation is extensive as I was involved in Section 1 (Warkworth to Te Hana) of the Northland Corridor project and the SH1 Brynderwyn Hills recovery project.

1.2.2. Lisa Denmead: Invertebrate Lead

I am an ecologist, employed by WSP New Zealand Limited (WSP) in the role of Principal Ecologist, a role I have held since January 2026 (previously a Senior Ecologist since January 2022).

I hold a BSc, MSc and PhD in Biodiversity and Ecology. I have 5.5 years' experience as a consultant ecologist and four years' experience as a lecturer in Environmental Management. My MSc and PhD research focused on invertebrate ecology. I am a member of the NZES and the EIANZ

My recent experience relevant to this Application includes:

- **Taihape Road (2024-2025):** Technical lead for invertebrate ecology. Co-author of the Ecological Impact Assessment, Wildlife Act Application and Ecological Management Plan. Implementation of ecological management for vegetation removal under the Wildlife Act Authority.
- **American Samoa Wind Farm (2024-2025):** Technical Lead for invertebrate ecology. Development of survey methodologies for endangered snail species, field assessments and co-author of Ecology report outlining mitigation options for the Wind Farm development.
- **SH1 Brynderwyn Hills Recovery Project (2023-2024):** Technical Lead for invertebrate ecology and Task Manager for all ecological components of the Project. Co-author of the Ecological Impact Assessment, Wildlife Act Application, Ecological Management Plans and compliance reporting.

I have been involved with the Northland Corridor – Alternative to the Brynderwyn Hills project since August 2024.

1.3. Code of Conduct

Although this matter is not before the Environment Court, we confirm that we have read the Code of Conduct for expert witnesses as contained in Section 9 of the Environment Court Practice Note 2023. We agree to comply with that Code. Our qualifications as an expert are set out above. We are satisfied that the matters which we address in this report are within our area of expertise, except where we state that we are relying on information provided by another person or expert. We have not omitted to consider material facts known to us that might alter or detract from the opinions we express.

2. Assessment Methodology

2.1. Overarching Approach

The overarching approach that has been used to assess the significance of ecological effects associated with the Project is based on the stepped impact assessment process described in the Ecological Impact Assessment (EcIA) Guidelines (2nd Edition) published by the EIANZ (Roper-Lindsay et al., 2018). The first step in the assessment process is to assign ecological values based on representativeness, rarity/distinctiveness, diversity/pattern, and ecological context (refer to Table 1, Table 2 below). Based on the assigned values for each matter, the ecological aspects of a project are then assessed using the attributes matrix in Table 6 (reproduced as Table 3 below) and Appendix 10 of the guidelines.

Chapter 6 of the EcIA guidelines provides criteria for determining the magnitude of effects. The level of effect is determined by combining the value of the ecological feature/attribute with the score or rating for the magnitude of effect to create 'criteria' for describing the level of effects (Table 4). Low or very low levels of effect are described as a "low risk" to ecological values rather than low ecological values. A moderate or higher level of effect requires careful assessment and analysis of the effects management requirements on a case-by-case basis.

Table 1: Assessment matters to be considered when assigning ecological value in accordance with the EIANZ EcIA Guidelines (p64).

Matter	Attributes to be considered
Representativeness	Criteria for representative vegetation and aquatic habitats: ▪ Typical structure and composition ▪ Indigenous species dominate ▪ Expected species and tiers are present ▪ Thresholds may need to be lowered where all examples of a type are strongly modified Criteria for representative species and species assemblages: ▪ Species assemblages that are typical of the habitat ▪ Indigenous species that occur in most of the guilds expected for the habitat type
Rarity / distinctiveness	Criteria for rare/distinctive vegetation and habitats: ▪ Naturally uncommon, or induced scarcity ▪ Amount of habitat or vegetation remaining ▪ Distinctive ecological features ▪ National priority for protection Criteria for rare/distinctive species or species assemblages: ▪ Habitat supporting nationally Threatened or At Risk species, or locally uncommon species ▪ Regional or national distribution limits of species or communities ▪ Unusual species or assemblages ▪ Endemism
Diversity and pattern	▪ Level of natural diversity, abundance and distribution ▪ Biodiversity reflecting underlying diversity ▪ Biogeographical considerations – pattern, complexity ▪ Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological Context	▪ Site history, and local environmental conditions which have influenced the development of habitats and communities ▪ The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience (from "intrinsic value" as defined in the Resource Management Act 1991 (RMA)) ▪ Size, shape and buffering ▪ Condition and sensitivity to change ▪ Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material

Matter	Attributes to be considered
	▪ Species role in ecosystem functioning – high level, key species identification, habitat as proxy

Table 2: Factors to consider when assigning ecological value to species in accordance with the EIANZ EcIA Guidelines (p67).

Matter	Value
Nationally Threatened species, found in the Zone of Influence (ZOI) either permanently or seasonally	Very High
Species listed as At Risk – Declining, found in the ZOI, either permanently or seasonally	High
Species listed as any other category of At Risk, found in the ZOI either permanently or seasonally	Moderate
Locally (ED) uncommon or distinctive species	Moderate
Nationally and locally common indigenous species	Low
Exotic species, including pests, species having recreational value	Negligible

Table 3: Scoring for sites or areas combining values for four matters in accordance with the EIANZ EcIA Guidelines (p69).

Matter	Value
Area rates High for 3 or all of the four assessment matters listed in **Table 4**. Likely to be nationally important and recognised as such.	Very High
Area rates High for 2 of the assessment matters, Moderate and Low for the remainder, or Area rates High for 1 of the assessment maters, Moderate for the remainder. Likely to be regionally important and recognised as such.	High
Area rates High for one matter, Moderate and Low for the remainder, or Area rates Moderate for 2 or more assessment matters Low or Very Low for the remainder Likely to be important at the level of the Ecological District.	Moderate
Nationally and locally Area rates Low or Very Low for majority of assessment matters and Moderate for one. Limited ecological value other than as local habitat for tolerant native species, common indigenous species	Low
Area rates Very Low for 3 matters and Moderate, Low or Very Low for remainder.	Negligible

Table 4: Criteria for describing level of effects in accordance with the EIANZ EcIA Guidelines (p84).

Ecological Value → Magnitude of effect ↓	Very high	High	Moderate	Low	Negligible
Very high	Very High	Very High	High	Moderate	Low
High	Very High	Very High	Moderate	Low	Very low
Moderate	High	High	Moderate	Low	Very low
Low	Moderate	Low	Low	Very low	Very low
Negligible	Low	Very low	Very low	Very low	Very low
Positive	Net gain	Net gain	Net gain	Net gain	Net gain

2.2. Desktop Assessment

We undertook a desktop assessment to obtain information and data relating to the potential presence of terrestrial vegetation and fauna within the Proposed Designation. We reviewed the following data sources:

- Department of Conservation (DOC) Bioweb database for records of herpetofauna (within 15 km) and bats (within 25 km).
- Protected Natural Areas Programme (PNAP) reports of Otamatea Ecological District (Lux & Beadel, 2006), Waipu Ecological District (Lux et al., 2007), and Rodney Ecological District (Goldwater et al., 2012).

- iNaturalist records for Threatened and At Risk terrestrial invertebrates and plants and native lizards in proximity to the Proposed Designation. Note: GPS coordinates are 'obscured' for At Risk and Threatened species on iNaturalist and may affect spatial accuracy.
- Recent (within 25 years) Global Biodiversity Information Facility (comprises a number of taxonomic databases) Threatened and At Risk terrestrial invertebrate records within 5 km.
- Botanical surveys previously conducted within the wider area of the Brynderwyn Hills area including:
  - Auckland Botanical Society Field trip report: Brynderwyn Hills (Jones, 1991).
  - Auckland Botanical Society report: Marunui Conservation Area, Mangawhai (Cameron, 2010).
  - A botanical assessment conducted at Pukearenga Hills, Maungaturoto, Northland (Clunie, 1985).

2.2.1. Additional information sources

We also reviewed other information sources and reports to support the assessment, including:

- DOC Threat Classification Series for vascular vegetation (de Lange et al., 2024), amphibians (Burns et al., 2018); bats (C. O'Donnell et al., 2018); reptiles (Hitchmough et al., 2021); and gastropods (Walker et al., 2023).
- Threatened plants of Northland Conservancy (Forester & Townsend, 2004).
- Indigenous terrestrial and wetland ecosystems of Auckland (Singers et al., 2017).
- Ecological assessment reports previously composed for the NZTA Brynderwyn Hills Recovery Project ("Brynderwyn Recovery Project"). A large proportion of the Brynderwyn Recovery Project survey area and works footprint was within the Proposed Designation:
  - Ecological Impact Assessment (WSP, 2024a)
  - Frog Survey and Salvage Report (WSP, 2024c)
  - Ecology Compliance Report (WSP, 2024b)
- Manaaki Whenua Landcare Research Landcover Database Version 6.0 (Manaaki Whenua Landcare Research, 2025);
- Satellite imagery via Northland Regional Council Local Maps.

2.3. Field Assessment

2.3.1. Vegetation

We undertook field surveys of terrestrial vegetation within the Proposed Designation between September and November 2025. We used a walk–through survey method to assess vegetation composition, structure, species diversity, and ecological value. We traversed accessible areas of indigenous and exotic vegetation, excluding pasture and rank grassland unless other vegetation was visibly present. We also recorded incidental observations of regionally or nationally At Risk or Threatened flora species (de Lange et al., 2024; Forester & Townsend, 2004). We broadly classified and named vegetation communities following structure classes based on Atkinson (1985) (Table 5) We also used Singers et al. (2017) to assist in classifying certain indigenous ecosystem types. Where applicable, we used generic descriptors such as 'exotic scrub' or 'broadleaf scrub' to group similar vegetation types, summarise ecological value, and to delineate boundaries of similar vegetation types.

Table 5: Vegetation description naming conventions used in accordance with Atkinson (1985)

Notation device	Definition
Species1 / Species	Forward slash indicates species are in different height tiers, with the tallest tier always listed first. i.e. Species 1 is a tier above Species.
Species - Species	Hyphens indicate species occupy the same structural tier

We estimated species frequency as percentage cover within each height tier, using the following frequencies:

- “Dominant” (>50% cover)
- “Common” (between 20-50% cover)
- “Frequent” (between 10-20% cover)
- “Occasional” (less than 10% cover)

Further, if a species is abundant or common only within small patches of the contiguous vegetation, we described it as “locally abundant” or “locally common”.

We mapped vegetation type extent using a combination of field surveys, aerial imagery, Google Street View, topographic data and observations from vantage points. We digitised mapping using ArcGIS Pro, with higher resolution mapping applied to areas closer to the Indicative Alignment and broader mapping used for areas further away (i.e. closer to the Proposed Designation boundary). We refined vegetation delineation iteratively during multiple site visits at the same properties. We coded and named each vegetation community sequentially (North to South) according to their location within the Project Earthwork Zones. These are which are four distinct areas (1–4) that subdivide the Proposed Designation into sections where earthworks are anticipated to be staged during construction.

2.3.2. Lizards

Lizard surveys and habitat assessments were undertaken by herpetologists and experienced ecologists between October 2025 and December 2025 under Wildlife Act Authorisation (WAA) 121261-FAU. Those assessments included a combination of site walkovers, habitat assessments and targeted herpetofauna surveys comprising daytime Manual Habitat Searches (MHS), Artificial Cover Object (ACOs) surveys and nocturnal spotlighting. Detailed methodology for each survey technique is outlined below. Our survey effort within the Proposed Designation focused on areas that we had identified during our desktop assessment and initial site walkovers as containing suitable habitat for native lizard species, with an emphasis on higher quality habitat and areas most likely to be directly impacted by the Project. Native lizards captured during field surveys were carefully handled, with basic metrics recorded where possible, including species identification, snout-vent length, total length and sex. All individuals were carefully released at the point of capture or into nearby suitable habitat.

Habitat assessment

We undertook initial habitat assessments across the Proposed Designation in September 2025 using aerial imagery and site walkovers to identify potential herpetofauna habitat. Prior to gaining the Survey WAA, we undertook initial site walkovers and Ground Truthing to assess and map vegetation and suitable habitat types for herpetofauna. We mapped areas we considered contained suitable habitat for herpetofauna. We then assessed those areas for suitability for further infield investigations with ACO deployment, nocturnal spotlighting, and MHS.

Areas of interest for infield surveys included various habitat types such as rank grass, exotic and native scrub / forest, wetlands, and structural habitat such as leaf litter, rocks, logs/woody debris, fence posts, and other artificial and natural objects. Dense vegetation and debris piles provide microhabitats with stable temperature and humidity, which are important for lizards.

Due to the staggered nature of private property access for ecological survey during the survey period, we conducted habitat assessments on the first walkover of each property (where access was available) and continued assessments following the issue of the survey WAA in October through to the end of survey.

Manual habitat searches

We employed MHS to detect lizards, in particular ground dwelling skink species, within the Proposed Designation. Targeted daytime MHS focused on suitable habitat and refugia, prioritising higher quality habitat more likely to be impacted by the Project, but also included representative habitats across the wider Proposed Designation. Targeted MHS followed Whitaker’s (1994) ‘searching by day’ methodology.

Searches involved hand searches of rank grass, leaf litter, and dense groundcover, as well as lifting natural cover objects such as rocks, bricks, fence posts, rotting logs, cut wood, broken concrete, and other assorted debris including farm implements, corrugated iron and tarpaulins/soft plastics. We also searched holes and crevices in large dead wood items and debris piles. MHS generally targeted microhabitats where lizards are most likely to occur, particularly in areas of fragmented and/or modified landscapes across the Proposed Designation.

We also undertook opportunistic MHS during various site walkovers and while completing or transitioning between other formal survey components during the period of October to December 2025.

We conducted MHS during daylight hours under suitable weather conditions (mild-warm temperatures, low wind, and minimal precipitation), as these factors influence lizard activity and detectability. A total of approximately 52 person hours of MHS effort was undertaken across the Proposed Designation ensuring robust coverage of potential refugia. Of this, we allocated approximately 16 hours to combined lizard and invertebrate searches, while we focused 36 hours specifically on lizards.

Artificial Cover Object survey

We deployed ACOs to enhance detection of Cryptic terrestrial lizard species such as copper skink (*Oligosoma aeneum*). ACOs provide standardised easily deployed and inspected refugia that mimic natural cover objects, offering shelter and thermoregulation for lizards while enabling repeated monitoring with minimal habitat disturbance (Lettink & Monks, 2016; Wiedemer et al., 2007).

The ACOs were made of *Onduline,* a lightweight corrugated roofing material and measured approximately 400 millimetres (mm) x 450 mm. ACOs were double layered, with small sticks or twigs placed between each layer and a larger log laid on top to prevent movement during the survey period.

We used double layered ACOs to increase occupancy potential by providing greater surface area, structural complexity and microclimate diversity within the ACO. The design also enhanced attractiveness to terrestrial gecko species such as the pacific gecko (*Dactylocnemis pacificus*), which are likely to be present within the preferred corridor and are known to utilise terrestrial refugia.

In total, we deployed 165 double layered ACOs across representative areas of suitable, high-quality habitat across the preferred corridor. The ACO locations are shown in **Appendix A**.

Spotlighting

We conducted nocturnal spotlighting surveys using a combination of powerful headlamps and handheld torches. Survey effort on a particular site depended on the size, quality and type of habitat and vegetation, and its suitability to support native geckos. The survey included both close-range spotlighting of vegetation and using binoculars from a distance to look for both eye shine from the lizards and/or lizard bodies.

Spotlighting occurred across six nights between October and November 2025 during suitable weather conditions, including mild temperatures, light wind, and no rainfall. This included a total of approximately 49 person hours.

2.3.3. Frogs

Hochstetter's frog surveys and habitat assessments were undertaken by approved herpetologists and experienced ecologists between October and December 2025 under WAA 121261FAU. Methods included site walkovers, habitat assessments, daytime MHS, and targeted 50 m frog survey transects. Our survey effort within the Proposed Designation focused on areas we identified during desktop assessment and initial walkovers as containing suitable habitat for Hochstetter's frogs, particularly higher quality habitat and areas likely to be directly affected by the Project. All surveys were completed during daylight hours in warm, low-flow conditions, when frogs are typically inactive and underneath cover objects. Survey locations are shown in **Appendix B-1**.

Habitat Assessment

We assessed habitat in streams and wet areas, (e.g., rocky seepages) containing suitable microhabitats and refugia for frogs. Low flow streams with complex microhabitats, low sedimentation and good water

quality are generally more suitable, and undisturbed streambeds and riparian areas/vegetations improve habitat quality.

High quality habitat where high numbers of frogs would be expected are typically:

- Headwater or low order streams with permanent to intermittent flow, less than 2 m wide, fully shaded by native vegetation with bedrock or hardbottom stream beds on steep to moderate slopes. These streams generally consist of cascade complexes containing an abundance of microhabitats including small and large cobble/rock areas, woody debris and dams, root masses, dense leaf litter and crevices that often interact with each other to form complex microhabitats.

Moderate quality habitat where small numbers of frogs would be expected are typically:

- Low to high order streams with permanent or intermittent flow, less than 4 m wide, moderate shade by native and/or exotic vegetation, with sections of bedrock or hardbottom stream bed on steep to gentle slopes. These streams generally contain some suitable macrohabitat refugia, including stacked small to large rocks, cobbles, coarse woody debris (logs or tree fall) and leaf litter, often stacked on each other creating microhabitats.

Low quality habitat where only very low numbers of frogs are typically:

- Ephemeral streams that are not flowing, areas of dry stream bed, higher order streams with no flow or very fast flow and/or that are greater than 4 m wider with high sun exposure (poor shading), steep stream banks where the wetted width and bank-full width are the same or very similar and/or with gentle to no gradient and/or a softbottom stream bed with high sedimentation. These streams generally lack or have very low available and suitable microhabitat and refugia for native frogs.

Manual Habitat Searches

Where suitable habitat was present, we sometimes undertook opportunistic and incidental MHS first to assess the likely presence or absence of Hochstetter's frogs, prior to undertaking frog survey transects where required. MHS focused on shaded streams with suitable microhabitats along the preferred corridor, with a focus on streams that provided the most suitable potential habitat as described above, particularly where frogs had not previously been recorded. We prioritised higher quality habitat likely to be impacted by the Project, although we searched lower quality streams and small seepages where suitable refugia were present. We used the MHS to determine the likely presence or absence of frogs prior to undertaking frog survey transects if presence was confirmed.

Searches consisted of authorised ecologists systematically hand searching suitable habitat and key potential refugia (rocks, woody debris, leaf litter, crevices and root systems) using headtorches and carefully returning searched habitat as close as possible to their original position. Search effort was recorded as length of stream and person hours. Where frogs were found, GPS position, refugia type and snout-urostyle length (mm) were recorded and the stream was marked for transect surveys. In total, we completed 7.3 person-hours of MHS. Strict frog hygiene protocols were followed throughout the MHS.

Frog Survey Transects

We conducted targeted Hochstetter's frog transect surveys to quantify the relative abundance of Hochstetter's frogs across the Proposed Designation. We undertook fifty-five surveys, covering 2.8 kilometre (km) of stream and 48.8 hours of two-person survey effort (Table 6). Where possible, we standardised survey search time to as close to one hour per survey as possible to ensure consistent search effort across each survey. However, surveys with higher frog density in general took longer than those with less due to the processing time for each frog.

Table 6: Hochstetter's frog survey effort across the different construction zones.

Zone	Location	Number of Transects	Length of Transects	Survey time (Hours)
1	Northern Brynderwyn Hills - Waipu	10	0.5 km	10.8
2	Zentral Forest Estate and Brynderwyn Hills Crown Land	36	1.7 km	28.8
3	Mayflower Farms Limited	4	0.2 km	4.3
4	Pukekaroro	5	0.4 km	5.0

We selected survey sites to provide spatial coverage across the Proposed Designation where suitable habitat was present or likely, with emphasis on areas potentially affected by the Indicative Alignment. We assessed habitat suitability at each site; if unsuitable, we shifted the transect up- or down-stream until a suitable 50 m reach was located.

Generally, we assessed a stream as being not suitable for survey if it was unlikely to provide habitat for frogs (see low habitat quality descriptions above) or the area could not feasibly be searched or was unsafe to search due to steep hill sides, tree fall or multiple large waterfalls.

At each transect, we recorded stream width, GPS coordinates and riparian vegetation type. We recorded the dominant microhabitat type (rock, wood, vegetation/roots, and crevices/undercut banks) at 1 m intervals along transects. We also recorded start and end times for each transect.

We used a double-observer protocol, with two suitably experienced ecologists conducting independent searches one after the other following standard methods (Baber et al. 2010, Longson et al., 2017; A. H. Whitaker & Alspach, 1999). Searching progressed upstream, overturning manageable rocks, woody debris, left litter and all other searchable habitat and using headlamps to aid detection. Searches were generally restricted to stream beds and banks, extending up to two metres (m) above or away from the water level. To maintain the integrity of the double-observer approach, surveyors carefully replaced all refugia to their original positions after inspection. Co-detected frogs were recorded only once. Frog hygiene protocols were strictly adhered to.

Where possible, we processed frogs in situ without handling, minimising stress and disease risk. For each frog encountered, the following data was recorded:

- position along transect (m);
- microhabitat/refugia type;
- SUL, (mm);
- life stage (adult/juvenile); and
- photographs with scale where possible.

If a frog could not be measured (i.e., jumped away or was deep in a crevice), we estimated its size by life stage.

2.3.4. Bats

Acoustic surveys

We undertook two acoustic bat surveys. The first survey was conducted from September to November 2025, and the second from January to February 2026. These timeframes coincide with the period after bat parturition, when both adults and newly volant juveniles may be more widespread. We deployed a total of 48 automated bat monitors (ABM)s; AR4 model, DOC Electronics Unit)) across the Proposed Designation during the first survey. Four ABM locations were excluded from the second survey due to land access restrictions. We deployed ABMs in areas targeting habitats known to be favoured by long-tailed bats such as stands of mature trees, edge habitats, and stream corridors. We did not place monitors targeting Northern short-tailed bats (*Mystacina tuberculata aupourica*) as they have only been detected in two locations in Northland more than 80 km from the Proposed Designation.

We programmed ABMs to record from one hour before official sunset to one hour after official sunrise for a minimum of 21 ‘valid’ nights. A valid night was defined as a night where:

- Temperatures remained 8 °C or above for the first four hours after official sunset.
- No to very little precipitation within the first four hours after official sunset (i.e. no more than 5 mm of rainfall).
- No to light wind within the first four hours after official sunset.
- Nights that did not meet the weather thresholds were excluded from analysis.

- Data was processed using BatSearch3 software (DOC, 2016). Spectrograms were reviewed and assigned as either 'non-bat' or 'long-tail' by a suitably qualified ecologist[1]. Bat activity levels were calculated as the average number of bat passes per valid night at each site (total passes/valid nights). It is important to note that the number of passes cannot be considered indicative of population size as the movement of an individual bat can generate multiple passes.

Habitat assessment

We carried out a high-level habitat assessment to determine the extent of potentially suitable bat habitats within the Proposed Designation, including vegetation, stream/riparian corridors, wetlands, open water, and pasture. Following this assessment, we categorised habitats as either 'High-potential bat roosting habitat' or 'High-potential bat habitat' based on their suitability for long-tailed bats. We defined "High-potential bat roosting habitat" as individual trees and/or areas of a similar vegetation type with a diameter at breast height (DBH) greater than 15 cm with one or more of the following features:

- Cracks, crevices, cavities, fractured limbs, or other deformities, large enough to support roosting bat(s);
- Sections of loose flaking bark large enough to support roosting bat(s);
- A hollow trunk, stem or branches;
- Deadwood in canopy or stem of sufficient size to support roost cavities or hollows; and/or
- Individual trees with high epiphyte loading of sufficient density to support roosting bat(s).

We defined "High-potential bat habitat" as, stream/riparian corridors, wetlands, open water, and pasture within 25 m of High-potential bat roosting habitat or tall stature vegetation that may provide commuting and foraging habitat for long-tailed bats.

We defined "Low-potential bat habitat" as trees or areas of vegetation less than 15 cm DBH with no visible roost features and/or open pasture that was more than 25 m away from High-potential bat roosting habitat or tall stature vegetation.

2.3.5. Invertebrates

Invertebrate surveys were completed October – November 2025 and consisted of a combination of:

- MHS;
- Targeted timed plots for land snails;
- Spotlighting;
- Opportunistic searches.

The surveys primarily targeted kauri snail and *Amborhytida dunnaie* (recording both live and empty shells), however, we also documented incidental observations of other notable invertebrate species. Microhabitats targeted included damp leaf litter, decaying logs, rock crevices and dense vegetation layers.

We completed a total of 36 person-hours of MHS across the Proposed Designation of which 16 hours were combined lizard and invertebrate searches, and 20 hours were dedicated solely to invertebrates (**Appendix C**), typically when lizard habitat or weather conditions were not suitable for lizard surveys. We undertook MHS across a range of forested habitat types, allowing efficient coverage of the diverse habitats present within the Proposed Designation. Within each habitat type, MHS targeted the microhabitats most likely to support native invertebrate species.

We completed eight person hours of spotlighting in high-quality kauri snail habitat to search specifically for kauri snails which are primarily active at night. We also conducted spotlighting at locations with high-

[1] Certified as competent in 'Assessing roost tree use using Automatic Bat Monitors' Competency 3.1, Bat handling competencies authorisation (Bat Recovery Group, 2022).

quality gecko habitat (see Section 2.3.2), a subset of which was also high-quality kauri snail habitat (**Appendix C**).

We conducted thirty-nine targeted land snail surveys in forested areas without consistent stock access, using timed 10 × 10 m plots (**Appendix C**). We surveyed each plot based on a standard effort of 0.5 person hours per plot. These surveys allowed focused effort across the potential snail habitats, particularly given the small size and Cryptic nature of *A. dunnaie*, which require close inspection of leaf litter, and other refugia.

We also carried out opportunistic searches for snails and other notable invertebrates (e.g. peripatus) in suitable habitat while completing or transitioning between other formal ecological survey components. These searches supplemented targeted efforts and increased spatial coverage across the Proposed Designation.

2.4. Alignment changes within the Proposed Designation

The Indicative Alignment within the Proposed Designation represents a possible alignment that has been developed for assessment purposes and to illustrate what the Project's final design might look like, and the effects generated by its construction and operation. The alignment that gets built, including the design and placement of bridges, culverts, stormwater systems, soil disposal areas and landscaping, will be refined and confirmed during the detailed design stage. As a result, this assessment has anticipated impacts within the wider Proposed Designation, rather than just the footprint of the Indicative Alignment. The proposed conditions establish outcome-based criteria that will ensure effects on the environment are adequately avoided, remedied or mitigated, in relation to values of the impacted areas, regardless of the final design and construction methodology for the Project. As such, should the final alignment within the Proposed Designation change, the effects assessment, proposed mitigation and recommendations outlined in this report would remain appropriate.

3. Existing Environment

The existing environment across the Proposed Designation is explained in detail in Volume A, Part B of the Substantive Application. The nature of the existing environment as it relates to terrestrial ecology is discussed here for the purposes of this assessment.

3.1. Vegetation

3.1.1. Desktop assessment

Our desktop assessment identified a range of vegetation community types within the Proposed Designation. North and south of the Brynderwyn Hills, the landscape is largely comprised of high-producing exotic grassland across low rolling hill country and lowland plains. These areas are interspersed with scattered, modified indigenous forest remnants of varying sizes and ecological condition, many of which had previously been described in the PNAP reports (Goldwater et al., 2012; Lux et al., 2007; Lux & Beadel, 2006).

Within the Brynderwyn Hills, vegetation is largely characterised by contiguous exotic pine forest and indigenous forest. A large proportion of the indigenous vegetation in the Brynderwyn Hills within the Proposed Designation was previously assessed against the criteria set out in Appendix 1 of the National Policy Statement for Indigenous Biodiversity 2023 for the Brynderwyns Recovery Resilience Project (WSP, 2024a) and it was concluded that the area would qualify as a Significant Natural Area (SNA). As the Proposed Designation reaches towards Pukekaroro larger indigenous forest remnants also persist.

3.1.2. Field surveys and observations

Field surveys identified 35 different vegetation types across the Proposed Designation (Table 7). Detailed descriptions of each classification type and associated maps of the observed vegetation are provided in **Appendix D** and **Appendix E**. A full summary of the vegetation types that were mapped and assessed is provided in **Appendix F**. Areas of vegetation that could not be accessed by field ecologists were delineated on the maps as “Classified (tentative)”.

Table 7: The vegetation types recorded within the Proposed Designation during field surveys.

Classification	Area (ha)	Native/exotic
Anthropic tōtara forest	19.5	Native
Bamboo forest	0.1	Exotic
Broadleaved species scrub forest	26.8	Native
Crack willow/mixed exotic and native shrub/exotic groundcover	20.3	Exotic
Crack willow-exotic trees-remnant native trees/mixed exotic and native shrub	2.5	Exotic
Eucalyptus treeland/ranked grassland	1.2	Exotic
Exotic pine forest/mixed native and exotic scrub/ranked grassland	256.9	Exotic
Exotic pine forest/native broadleaf scrub	0.4	Exotic
Gorse shrubland	0.3	Exotic
Japanese cedar hedgerow	0.7	Exotic
Kahikatea forest	1.0	Native
Kahikatea treeland	4.2	Native
Kahikatea-kauri-totara treeland	1.6	Native
Kahikatea-pukatea forest/native scrub/tradescantia	2.5	Native
Kānuka forest	58.4	Native
Kānuka treeland/native and exotic scrub/ranked grassland	6.2	Native

Classification	Area (ha)	Native/exotic
Kauri-podocarp forest	24.5	Native
Kohekohe-taraire-tawa-podocarp/broadleaf	49.7	Native
Lawson's cypress-exotic pine treeland	0.9	Exotic
Macrocarpa/mixed native and exotic scrub/ranked grassland	1.0	Exotic
Mixed exotic-native scrub and hedgerow scrub	1.1	Exotic
Mixed tall exotic shelterbelt treeland	1.7	Exotic
Nīkau treeland	0.1	Native
Ornamental plantings and gardens	5.4	Exotic
Planted native vegetation	11.2	Native
Poplar treeland/exotic scrub/ranked grassland	5.3	Exotic
Pūriri forest/ranked grassland	1.7	Native
Redwood treeland/ranked grassland	0.04	Exotic
Remnant Riparian podocarp-hardwood-kanuka treeland	13.1	Native
River she-oak hedgerow	1.1	Exotic
Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland	3.1	Native
Tōtara forest/native broadleaf scrub	2.9	Native
Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland	4.8	Native
Tōtara-kauri/broadleaf scrub	4.0	Native
Rank grassland	N/A	Exotic

3.1.3. Threatened Plants

Desktop reviews identified eleven Nationally or Regionally At-Risk or Threatened plant species (de Lange et al., 2024) species within the Proposed Designation (Table 8). Site walkovers confirmed the presence of ten species within the Proposed Designation.

Table 8: Threatened and At Risk plant species identified during the desktop reviews and whether they were recorded during field surveys.

Scientific Name	Common name	National Threat Classification	Observed during surveys
Lophomyrtus bullata	Ramarama	Threatened – Nationally Critical	–
Solanum aviculare var. aviculare	Poroporo	Threatened – Nationally Endangered	✓
Muehlenbeckia complexa var. grandifolia	–	Threatened – Nationally Vulnerable	✓
Agathis australis	Kauri	At Risk – Declining	✓
Carmichaelia australis	Common native broom	At Risk – Declining	✓
Leionema nudum	Mairehau	At Risk – Declining	✓
Mida salicifolia	Maire taiki	At Risk – Declining	✓
Metrosideros robusta	Northern rātā	At Risk – Declining	✓
Doodia mollis	Mokimoki	At Risk – Naturally Uncommon	✓
Doodia squarrosa	–	At Risk – Naturally Uncommon	✓
Hypolepis dicksonioides	Giant hypolepis	At Risk – Naturally Uncommon	✓

A full list of all plant species recorded within the Proposed Designation is provided in **Appendix G**.

3.2. Lizards

3.2.1. Desktop assessment

The DOC Bioweb herpetological database and iNaturalist show only one record of native lizard within the Proposed Designation, a copper skink (*Oligosoma aenem*), found during the 'SH1 Brynderwyns Hills Recovery Project' survey and salvage (WSP, 2024a, 2024b). A single gecko footprint (lamellae print) was also recorded during that project on a tracking card deployed within the Proposed Designation, however, the gecko species could not be determined. Seven additional native lizard species were identified in the desktop assessment within 15 km radius of the Proposed Designation, and of those, five species are considered possibly or likely present within the Proposed Designation (Table 9).

'Introduced and Naturalised' plague skink (*Lampropholis delicata*) records are present within the Proposed Designation and are known throughout the wider area, including numerous observations during the 'SH1 Brynderwyns Hills Recovery Project' (WSP, 2024a, 2024b). Plague skinks are classified as an 'Unwanted Organism' under the Biosecurity Act (1993) and therefore have no legal protection and their ecological value is not considered further in this assessment.

Table 9: Native lizard species confirmed within 15 km of the Proposed Designation during the desktop assessment, their threat classification (derived from Hitchmough et al. (2021)), and likelihood of presence within the Proposed Designation.

Scientific Name	Common name	Māori Name	National Threat Classification	Closest Record / Source[2]	Probability On Site
Dactylocnemis pacificus	Pacific gecko	moko papa	Not Threatened	3.5 km west (Bioweb; Aug 2009)	Likely
Mokopirirakau granulatus	Forest gecko	mokopirirākau	At Risk - Declining	0.3 km west (iNaturalist; Oct 2025)	Likely
Naultinus elegans	Elegant gecko	moko kākāriki	At Risk - Declining	7 km west (iNaturalist; Jan 2017)	Likely
Oligosoma aeneum	Copper skink	-	At Risk - Declining	Multiple onsite (field surveys)	Confirmed
Oligosoma kakerakau	Kakerakau skink		Threatened – Nationally Critical	4 km north (iNaturalist; Jan 2017)	Highly Unlikely
Oligosoma moco	Moko skink	-	At Risk - Relict	15 km east (Bioweb Jan 2003)	Unlikely
Oligosoma ornatum	Ornate skink	-	At Risk - Declining	15 km west (Bioweb; Oct 2010)	Possible
Oligosoma smithi	Shore skink	-	At Risk - Declining	2 km east (Bioweb; Feb 2007)	Highly Unlikely

3.2.2. Field surveys and observations

Observations

A total of 16 copper skinks were identified using MHS and ACO survey methods (**Appendix H**), a further six suspected copper skinks were observed but not able to be accurately identified as they escaped capture (Table 9). All but one of the copper skinks (and one likely copper skink) observed were recorded within the northern part of the Proposed Designation (north of the Brynderwyn Hills). No other native lizard species were observed or identified across all survey methods. The introduced plague skink, however, was observed in high numbers across most of the Proposed Designation.

[2] iNaturalist records: GPS coordinates are 'obscured' for At Risk and Threatened species on iNaturalist and may affect spatial accuracy.

Anecdotal observations of gecko species (likely Pacific and/or elegant gecko) in recent years were reported to us while undertaking field surveys on site by landowners across three properties. These properties contain high-value, high-quality habitat for Arboreal gecko species and as such we consider these observations reliable (see **Appendix I**).

Lizard Habitat in the Designation

1. Pasture Grass

Grazed pasture on farmland and managed grass within rural properties or on the edge of roads is the most common habitat type throughout the Proposed Designation. Rank grass is also common alongside fences, hedgerow vegetation and on the edge of vegetation fragments streams and wetlands and is often associated with low growing weed species. Grazed and managed pasture grass by itself generally provides very low or negligible habitat for skinks. However, grazed and managed pasture where there is also structural habitat and/or dense rank grass connected with other habitat types was often found to consist of moderate to high habitat quality for copper skinks.

2. Exotic Dominated Vegetation

Exotic vegetation within the Proposed Designation includes a large area of pine plantation forest (Zentral Estate Limited) within the Brynderwyn Hills, and small areas of isolated trees and some shelterbelt vegetation are scattered across the Indicative Alignment (e.g. macrocarpa etc). The large area of pine plantation is generally connected with areas of native forest. These areas are highly modified from forestry practices but retain good groundcover including wood slash, pine needles and low growing native scrubs and weeds creating low to moderate value habitat for skinks. A number of plagues and copper skink were observed within this habitat type, particularly within the edge habitat.

3. Native Dominated Vegetation

Native vegetation is common within the Proposed Designation and includes large areas of contiguous forest including regenerating and mature forest, smaller remnant vegetation fragments, riparian zones or streams and wetlands, isolated trees and hedgerows. Isolated trees, hedgerows and/or unfenced forest fragments often consist of minimal groundcover vegetation and are generally of low quality for native lizards. Large fragments, particularly areas with mature trees and fenced from animals and/or with cover objects, consist of moderate to high quality habitat for native lizards. This is the most common habitat type where copper skinks were recorded particularly within the edge habitat that had exposure to sun during the day.

4. Structures

Structures have been included as a habitat type as these are common across the Proposed Designation and provide variable habitat quality for copper skink. These areas often provided low to moderate quality habitat for copper skinks.

5. Wetlands and Streams

There are numerous wetlands and streams located within the Proposed Designation. Gecko species may be able to utilise the native tree fragments within these areas, while skinks could be present within drier edges of the wetlands and streams riparian zones (e.g. riparian zones).

Animal Pests in the Designation

A number of animal pests with the potential to adversely impact lizards were observed through incidental observations during field assessments and/or were recorded within Environmental DNA (eDNA) sampling as part of the Freshwater Ecology Sampling. These included possums, rats, dogs, hares, mice, stoat, rabbits, pigs, goats and wasps

Table 10: Likelihood of native lizards confirmed in the desktop assessment as being potentially, likely or confirmed present (Table 9) being present within the different habitat types: negligible, low, moderate, high, confirmed.

Common name	Ecological Value*	National Threat Classification	Overall likelihood with the Proposed Designation	Likelihood within habitat types				
				Pasture	Exotic Vegetation	Native Vegetation	Structures	Wetlands/ streams
Pacific gecko	Moderate	Not Threatened	High	Negligible	Negligible	High	Negligible	Moderate
Forest gecko	High	At Risk - Declining	High	Negligible	Negligible	High	Negligible	Moderate
Elegant gecko	High	At Risk - Declining	High	Negligible	Negligible	High	Negligible	Moderate
Copper skink	High	At Risk - Declining	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	High
Moko skink	Moderate	At Risk - Relict	Negligible	Low	Negligible	Low	Negligible	Negligible
Ornate skink	High	At Risk - Declining	Moderate	Low	Low	Moderate	Negligible	Negligible

* Values are based on the conservation status of each species set out in Section 2.1, apart from pacific gecko. While pacific gecko has been assigned a 'Not Threatened' conservation status based on stable populations on offshore islands, based on their rarity in the ecological district their value has been elevated to 'Moderate'.

3.3. Frogs

3.3.1. Desktop assessment

A review of the DOC Bioweb herpetological database confirmed multiple records of Hochstetter's frogs (pepeketua; *Leiopelma* aff. *Hochstetteri* "Northland") within Earthworks Zone 2 and within a 10 km radius of the Proposed Designation. Hochstetter's frog is the most widespread of New Zealand's endemic frogs but persists as fragmented populations across the northern half of the North Island (R. Burns et al., 2024). Genetic studies confirm that extant populations comprise 10 Evolutionarily Significant Units (ESUs) (Burns et al., 2025). The Brynderwyn population forms part of the northern clade, which is genetically distinct within the Northern ESU (Lillie et al., 2015). The northern clade of Hochstetter's frogs is classified as At Risk – Declining (Burns et al., 2025) and are protected under the Wildlife Act.

In 2023-2024 WSP undertook survey and salvage/relocation of Hochstetter frogs within the Crown owned land of the Brynderwyn Hills as part the Brynderwyns Recovery Project. That project area lies within the Proposed Designation, and therefore the results of that survey and salvage has been considered as part of this assessment. In total, 20 baseline surveys were undertaken during the Brynderwyns Recovery Project in streams that are also within the Proposed Designation as shown in **Appendix B**. In the streams impacted by the Project, across the baseline surveys, 30 frogs were recorded over 241 m transect length, equating to an average density of 12.5 frogs per 100 m (WSP, 2024a, 2024b). During the frog salvage and relocation phase in the same streams, a total of 150 frogs were salvaged from 144.4 m of habitat, yielding a rate of 103.9 frogs per 100 m. These results indicate that for every Hochstetter's frog detected during baseline surveying, approximately 8.2 frogs could be found during salvage operations. It is expected that not all frogs present are found during salvages, meaning the actual number of frogs potentially affected is likely to be higher than the 1: 8.2 survey-to-salvage ratio.

One record of the introduced and Naturalised species, the Green and golden bell frog (*Ranoidea aurea*) within the Project Designation was also noted during the desktop assessment. These frogs are likely to be present in suitable habitats throughout the Proposed Designation, but because they are introduced, they are not considered further in this assessment.

No other frog species were observed within the Proposed Designation.

Table 11: Summary of frog survey results.

Scientific Name	Common name	Māori Name	National Threat Classification	Closest Record / Source	Probability On Site
Leiopelma hochstetteri	Hochstetter's Frog	Pepeketua	At Risk – Declining	Within Proposed Designation	Confirmed
Ranoidea aurea	Green and Golden Bell Frog	-	Introduced and Naturalised	Within Proposed Designation	Confirmed

3.3.2. Field surveys and observations

Habitat assessment

Overview

Field assessments determined that the highest quality Hochstetter's frog habitat is located within the Brynderwyn Range Outstanding Natural Landscape (ONL) area. The ONL is a known stronghold for Hochstetter's frog, and we assessed all streams in that area as having high quality habitat. There is little to no suitable habitat to the north of the Brynderwyn Hills, and to the south the only suitable habitat is present within streams located within the remanent, Queen Elizabeth II National Trust (QEII) and Pukekaroro hills that have high-quality indigenous riparian vegetation. A full breakdown of the habitat present within each Earthworks Zone 1-4 is described below.

Zone 1

Potential frog habitat within Zone 1 consists of the Ahuroa River and the Waihoihoi River, including a few smaller tributaries of these rivers which flow through Zone 1. There are also numerous overland flow paths and farms drains transecting this Zone.

Over much of Zone 1, from north of the Waipu Township to the northern Brynderwyn foothills, there is very little suitable frog habitat, with potential frog habitat assessed as being of Low Quality as it consists of streams with high flow, generally greater than 4 m in width and poor shading, high sediment load and relative steep banks.

On the northern Brynderwyn foothills in Zone 1, there are high order tributaries of the Waihoihoi River that we have assessed as having Moderate quality frog habitat, due to them being higher order streams close to known populations of frogs that have indigenous riparian vegetation, with moderate shading, permanent flow and are less than 4 m wide with sections of bedrock and hard bottom stream bed. However, sections of these streams are unfenced and suffer from increased sedimentation and degradation due to the presence of rural livestock accessing the stream and riparian area. During site investigations, these streams were identified as having suitable habitat for Hochstetter's frog and we identified them for further survey.

Zone 2

Zone 2 has a small section of steep rural farmland with sparse unfenced indigenous vegetation along streams at the bottom of steep gullies in the north transitioning into the Zentral Forest pine plantation which is boarded by the high value native indigenous forest known as the Brynderwyn Range and bush margins ONL area to the south. Zone 2 has multiple high order tributaries of the Ahuroa, Waihoihoi and Piroa rivers that contain suitable habitat for Hochstetter's frogs in these areas.

In the rural farmland and Zentral forest, we assessed the habitat overall as having Moderate quality habitat. Within the pine plantation, there is generally a regenerating native vegetation understory around 5 m either side of streams. In a few places, patches of remanent mature indigenous podocarp-broadleaf forest remain. The streams generally suffer from high sediment loads likely caused by previous harvesting of the forest, which reduces the overall quality and availability of frog habitat. However, the presence of slash, dense leaf litter and in places bedrock and cobble stream beds provides suitable habitat for Hochstetter's frog, particularly in the steeper headwaters and low flow streams, where the impacts of sedimentation are also lower. Where more native riparian vegetation is present, habitat is improved. In places, particularly downstream, the streams have less shading, higher sediment loads, and higher flow; here habitat quality is reduced. Occasionally, wetland-like areas are present on the stream margins reducing the availability of frog habitat. At the northern end of the forest, we observed large waterfalls providing suitable habitat for Hochstetter's frogs but were unable to be safely searched.

We have assessed the Brynderwyn Range ONL area as containing High quality habitat. The Brynderwyn Range ONL contains multiple high order cascading bedrock streams with the most suitable habitat and highest quality habitat for frogs within the Proposed Designation. The steep terrain of the Brynderwyn ONL also includes a large number of bank seepages and small damp ephemeral streams that also provide suitable habitat. Across the Indicative Alignment within the Brynderwyn ONL, multiple cascading large waterfalls are present along the streams making access difficult, but these also provide high quality habitat for frogs. The Brynderwyn ONL provides particularly important habitat for Hochstetter's frogs as it is a large contiguous area of high-quality habitat. The dozens of small, rock filled, highly shaded headwater streams provide ideal habitats for all lifecycles of the Hochstetter frog, but in particularly for breeding females and juveniles. In particular we have determined that the ONL provides important breeding/nesting habitat for Hochstetter's frog as it provides an abundance of seepages and low flow streams with substantial rock cover, small pools with dense leaf litter cover, large invertebrate burrows (i.e. from giant dragonfly nymphs (*Uropetala carovei*) and likely underwater cavities which Hochstetter's frogs favour (Beauchamp et al., 2010; Bell, 1978). The uninterrupted streams and contiguous indigenous canopy cover of the ONL, both on the valley floor and up gullies to the ridges allows for the easy disbursement and movement of the frog population upstream, downstream and between gully systems of the Brynderwyn Hills and into the wider environment. It is our opinion that these catchment characteristics combined with

the high-quality habitat makes this area an important strong hold and potential source population/habitat area for Hochstetter's frog for the wider area.

Zone 3

We found the majority of Zone 3 to have very little to no frog habitat, and we assessed the streams and drains running through the rural farmland with no riparian vegetation as low quality habitat. There is some moderate to high quality habitat within the QEII covenant area. However, this area is extremely steep, and the majority of streams generally have very intermittent or zero to very low flow. There are sections of streams within the pockets of fenced and unfenced native vegetation that also have moderate to high quality habitat. These streams consist of low to medium flow bedrock, cascading streams with sufficient indigenous riparian vegetation to provide high levels of shading for the streams. Habitat is available in leaf litter and woody debris, with only a little rock/cobble habitat being present. These streams, being surrounded by farmland, and in many cases being unfenced or partially fenced, generally suffer from high levels of sedimentation, and in places, pugging which reduces the level of suitable habitat for Hochstetter's frog. In some areas of Zone 3, the underlying geology is dominated by limestone which can be seen in the stream beds. It is thought that this may be influencing pH levels within streams or otherwise making the streams unsuitable for frog occupation, but further investigation has not been undertaken.

Zone 4

Zone 4 contains rural farmland and pasture split in half by the indigenous forested hills between Pukepohatu / Baldrock hill and Pukearenga mountain.

We assessed habitat along tributaries of the Wairau River as containing no to low quality habitat for Hochstetter's frog. We assessed streams originating in the indigenous forested catchment on the southern side of the hills, flowing into the Kaiwaka river as having high quality habitat due to being headwater streams with permanent flow, less than 2 m wide, fully shaded by native vegetation with bedrock and hardbottom stream beds on steep to moderate slopes. The streams in these areas have an abundance of suitable habitat, including small and large cobble/rock areas, woody debris and dams, root masses, dense leaf litter and crevices.

Frog Survey Results

Overview

We found Hochstetter's frogs throughout many of the watercourses within the Brynderwyn Hills with the highest number of frogs found within one survey being 60 individual frogs over a 25 m transect. Streams within the native forest area of the Brynderwyn ONL area had the highest abundance of frogs. In the commercial pine forestry areas, where higher levels of sediment were present, frogs were generally found at a lower abundance. The highest number of frogs found within a 50 m transect in the pine forest was 20 individuals. We recorded a moderate population of Hochstetter's frogs in rural farmland within the northern Brynderwyn foothills, in a tributary of the Waihoihoi River. The stream sits within a remnant patch of indigenous vegetation surrounded by farmland but connected to a larger area of native bush to the east. **Appendix B-2** shows the location and number of frogs found during each survey across the Proposed Designation. No frogs were found during survey to the north or south of the Brynderwyn Hills within the Proposed Designation, though suitable high-quality habitat was present.

In the field surveys conducted for this assessment, we recorded a total of 318 Hochstetter's frogs over 55 frog survey transects, undertaken over 48 hours of double observer survey time (Table 12). A further 15 frogs were found through incidental MHS across the Proposed Designation. A full breakdown of the survey results can be found in **Appendix J**.

Two very small, low flow headwater streams within the Brynderwyn Range ONL had very high numbers of frogs present. Survey transects 2.25 recording 60 frogs over 25 m (being abandoned after 25 m as the stream was no longer safe to survey) and survey 2.29 recording 57 frogs over a 50 m transect. Both of these streams are within the Indicative Alignment and are small headwater streams at the top of the catchment dominated by stacked rock habitat, with dense leaf litter and wood debris. These results indicate these headwaters streams within the ONL have the highest frog habitat values across the Indicative Alignment.

Hochstetter's frogs are nocturnal, cryptic, and often occupy habitat that is difficult to survey using non-invasive methods. Salvage results from the recent relocation work during the Brynderwyns Recovery Project showed that actual frog densities can be up to 8.2 times higher than those detected during pre-salvage surveys. Table 12 shows the adjusted relative frog density (per 100 m) calculated from the numbers of frogs found during survey, adjusted by a ratio of 1:8.2 ratio, to show the potential actual number of frogs present. As a result, habitat that has not been confirmed to be used by frogs, or supporting only low detected numbers, may hold greater ecological value than survey results alone indicate.

Table 12: A summary of frog survey results. Detailed results can be found in Appendix J

Area	Transects	Length Surveyed (m)	Number of Frogs	Relative Survey Frog Density (per 100 m)	Adjusted Relative Frog Density (per 100 m)	Frogs Recorded in Stream eDNA Sampling
Zone 1	10	525	31	5.9	48.4	Yes
Zone 2[3]	36	1725	287	16.6	136.4	Yes
Zentral Forest	27	1335	89	6.7	54.7	Yes
Brynderwyn Range ONL	9	390	198	50.8	416.3	Yes
Zone 3	4	200	0	0.0	0.0	No
Zone 4	5	350	0	0.0	0.0	No
Total	55	2800	318	11.4	93.1	

3.4. Bats

3.4.1. Desktop assessment

A review of the DOC Bioweb bat database[4] returned a total of 471 long-tailed bat passes recorded within 10 km of the Proposed Designation. Previous survey efforts have predominantly occurred near the Atlas Quarry and the Brynderwyn Hills. There have been no published surveys undertaken in the northern or southern areas of the Proposed Designation.

As part of the Ecological Assessments associated with the Brynderwyn Hills Recovery Project (WSP, 2024a), three acoustic bat surveys were carried out in November 2023, January 2024, and April 2024. Across 15 ABMs a total of 13 long-tailed bat passes were recorded, with most activity concentrated in the northern Brynderwyn Hills. One potential Northern short-tailed bat pass was detected, though this is considered unlikely due to the site's distance from the nearest known population.

3.4.2. Field surveys and observations

Acoustic surveys

We undertook two acoustic bat surveys for this assessment, one in September – November 2025 and one in January - February 2026. Raw summary data for each monitoring site is provided in **Appendix K**, while **Appendix L** provides a location map of each monitoring site and the associated activity levels for each survey.

[3] Zone 2 has been split into two distinct areas being Zentral Forest and Brynderwyn Range ONL to demonstrate the large difference in the frog densities between these two areas.
[4] DOC Bat Database (2025).

Survey 1 (September – November 2025)

A total of 106 long-tailed bat passes were recorded across the 48 ABMs deployed during Survey 1. Each ABM operated for between 19 and 42 valid nights. Overall bat activity was very low, with an average of 0.06 passes per night (ppn), and detections were only recorded at 15 sites across the Proposed Designation.

Survey 2 (January – February 2026)

During Survey 2, a total of 16 long-tailed bat passes were recorded across 40 of the 44 ABMs deployed, each of which operated for between 13 and 21 valid nights. The remaining four ABMs failed completely and did not record any data. Bat activity was lower than that observed during Survey 1, with an average of 0.02 ppn, and detections were only recorded at nine sites across the Proposed Designation.

Only five sites recorded activity in both surveys, with a total of 19 sites with detections across at least one survey. The lower number of passes in Survey 2 are likely in part due to the exclusion of four sites (34 to 37) due to land access restrictions. However, this is not considered to materially affect the overall assessment as across all valid survey nights where data was obtained, sites 34–37 consistently recorded low levels of bat activity, with average activity rates of 0.72, 0.63, 0.03 and 0.00 ppn respectively. Average bat activity declined across the wider study area during Survey 2 compared to Survey 1 and noting that activity at nearby Site 33 during survey 2, (the closest monitored location to sites 34–37), also recorded a decrease. This suggests that the reduction in recorded activity reflects wider spatial or temporal variability in bat activity rather than a result of site exclusion. Across both surveys, bat activity was recorded between one to nine hours after sunset, with peak activity four hours after sunset. This temporal activity pattern indicates that bats are primarily foraging and commuting through the Project landscape. However, activity recorded within one hour of sunset at Site 25 and 34 during Survey 1, and Site 39 in Survey 2 may indicate potential roosting in nearby trees.

Habitat assessment

Overview

The existing environment within the Proposed Designation is predominantly highly modified for agricultural purposes (i.e. pasture) with scattered indigenous and exotic forest remnants of varying sizes.

Indigenous trees throughout the Proposed Designation such as tōtara, kānuka, rimu, pūriri, kahikatea, rewarewa, pukatea, and matai have the potential to offer suitable roosting habitat for long-tailed bats, particularly when mature due to the development of cavities, flaking bark, and deadwood. Several exotic species, including crack willow, macrocarpa, pine, and eucalyptus, may also provide suitable roosting habitat for bats and we have observed numerous trees with epiphytes of sufficient density to support roosting bats.

Important foraging habitat throughout the Proposed Designation includes wetlands (predominantly in Earthworks Zones 1 and 3) and streams/riparian corridors. Long-tailed bats often forage over or near water therefore, these habitats are particularly valuable due to the abundance of invertebrate prey they may provide (Griffiths, 2007). Bats are also known to forage and commute along edge habitats where tall stature vegetation is present, vegetated riparian corridors, and open pasture (Page-Corney, 2024). Likely the most important habitats for connectivity within the Proposed Designation are the native and exotic forest blocks between the Brynderwyns Hills Reserve and Waipū Gorge Reserve, as well as vegetation further south between the Pukareinga Reserve and Te o-Hau Reserve.

A description of the vegetation with respect to habitat for long-tailed bats in each Earthworks Zone is provided below. Maps with all areas identified as High potential bat roosting and/or High potential bat habitat are provided in **Appendix M**. For a detailed account of vegetation composition and mapping within the Proposed Designation refer to Section 0.

Zone 1

Both High potential bat roosting and foraging habitat is present throughout Zone 1. Many of the indigenous vegetation types observed provide potential bat roosting habitat with roosting features such as cavities, crevices, dense epiphytes, and flaking bark present. Further, many of the vegetation types are fragmented

with large edge to area ratios, providing suitable foraging and commuting habitat for bats. We also observed several wetlands and large continuous tracts of riparian vegetation along the Ahuroa River and Waihoihoi River and its tributaries, such as podocarp-hardwood-kanuka treeland and crack willow/mixed exotic and native shrub. Zone 1 also has long sections of shelterbelt and hedgerows which may provide foraging and commuting habitat. We commonly observed potential flyways between the scattered indigenous forest remnants.

Zone 2

Vegetation types in Zone 2 with High potential bat habitat include exotic pine forest/mixed native and exotic scrub/ranked grassland, and mature kohekohe-taraire-tawa-podocarp/broadleaf forest and kauri-podocarp forest. Broadleaved scrub forest under the current Transpower alignment, and the existing SH1 road alignment and forestry tracks may provide foraging/commuting habitat for bats. At the southern end of Zone 2, we also observed potential wetlands and several streams including the Piroa stream which may provide foraging and commuting habitat.

Zone 3

Pasture is the dominant vegetation type in Zone 3, although there are large contiguous remnants of kauri-podocarp-broadleaf forest, tōtara-kauri/broadleaf scrub, exotic pine/exotic scrub/ranked grassland, and other smaller, scattered, indigenous dominated vegetation types. High potential bat roosting habitat is available in the respective forest cores, with High potential bat habitat available along the edges. Linear features provided by exotic hedgerows of poplar and crack willow are also common, providing further High potential bat roosting habitat and High potential foraging and commuting habitat. There are several permanent streams, wetlands, and a pond in Zone 3 that are likely to provide valuable foraging habitat.

Zone 4

Large areas of High potential bat foraging habitat are available in Zone 4 due to the scattered vegetation with large edge to area ratios, although High potential bat roosting habitat is also available in the forest cores. The southern end of Zone 4 sits within a valley, with numerous indigenous dominated and exotic vegetation types such as kanuka and pines that are interspersed between open areas of pasture providing both High potential bat foraging habitat and High potential bat roosting habitat.

3.5. Invertebrates

3.5.1. Desktop assessment

The GBIF database and iNaturalist review identified two At Risk terrestrial snail species recorded within 5 km of the Proposed Designation Rhytididae carnivorous land snail (*Amborhytida dunniae* (At Risk – Declining), and kauri snail (*Paryphanta busbyi*: At Risk – Declining)) that have potential habitat present within the Proposed Designation. Kauri snails are listed as a protected species under the Schedule 7 of the Wildlife Act. No other Threatened, At Risk or protected terrestrial invertebrate species records were identified during the database reviews.

Peripatus (*Peripatoides* sp.) also known as velvet worms, records were also noted within proximity to the Proposed Designation during the desktop database reviews. Based on known distributions, the records are most likely *Peripatoides sympatrica*, a Not Threatened, and not protected species. However, peripatus are considered notable species as effects of development on the species are not well understood due to the limited knowledge of their taxonomy and ecology.

Targeted snail scoping surveys and manual searching during vegetation removal for the Brynderwyn Recovery Project (WSP, 2024b) identified a total of fifteen *A. dunniae* shells, seven in an initial survey (three confirmed empty) and eight during salvage efforts (five confirmed empty). No kauri snails were found during either scoping surveys or manual searches as part of the Brynderwyn Recovery works. However, a single empty shell was found within the Proposed Designation, west of SH1. Additionally, eight peripatus (species not confirmed) were salvaged through manual searches during construction of the Brynderwyn Recovery works.

3.5.2. Field surveys and observations

We recorded eighteen kauri snails (12 empty) and 60 *A. dunniae* shells (47 empty) during our field surveys (**Appendix N)**. We recorded *A. dunniae* shells in native and exotic forest, treeland and scrub from the plantation forest on Brynderwyn Hills south to the southern end of the Proposed Designation, with only one record north of the Brynderwyn Hills. We only recorded kauri snails south of the Brynderwyn Hills, in native forest and scrub.

Other notable invertebrates recorded during the surveys included glowworms (*Arachnocampa luminosa*) and peripatus. Glowworms were recorded during spotlighting and frog surveys at a number of forested streams within the Proposed Designation, including within indigenous and exotic plantation forests in the Brynderwyn Hills and indigenous remnants on farmland south of the Brynderwyns. We observed five peripatus (likely *P. sympatrica* but not confirmed), two within two separate areas of kānuka forest north and south of the Brynderwyns during snail plot surveys, and three within indigenous and exotic plantation forest the Brynderwyn Hills during frog surveys (2) and manual habitat searching (1).

Kauri snails, *A. dunniae*, and peripatus may be present throughout all forested habitats along the Proposed Designation, including exotic forest. However, survey results suggest that if present north of the Brynderwyn Hills, they occur in lower numbers than elsewhere along the route. The likelihood of occurrence for all three species is higher in mature, native forest without stock access, where cool, moist leaf litter provides more suitable microhabitats. Nonetheless, individuals of all three species are known to inhabit pine forest, particularly at the base of pampas and ferns close to the edges. Notably, we also found *A. dunniae* shells in Poplar treeland, Lawson's cypress treeland, crack willow/exotic scrub and a patch of eucalyptus treeland showing clear signs of pugging.

4. Assessment of Ecological Effects

4.1. Overview

This section describes the results and ecological values of the terrestrial ecosystems in the Proposed Designation from our desktop and field assessments of vegetation, lizards, frogs, long-tailed bats and terrestrial invertebrates (Section 4.2), followed by an assessment of actual and potential effects of the Project on terrestrial ecosystems (Section 4.3), including evaluation with and without mitigation efforts.

Potential and actual effects may be direct or indirect varying in both spatial and temporal magnitude. The ecological impacts identified in this assessment include impacts to terrestrial habitats and fauna, both temporary (short or long term) and/or permanent, that may occur during the construction and/or operation phases of the Project.

4.2. Assessment of ecological values

4.2.1. Vegetation Ecological Values

Vegetation types

Our vegetation assessment confirmed the presence of several vegetation communities that we have assessed as High or Very High ecological value based on the EIANZ matters, attributes and criteria specified in Table 1; the vegetation communities are provided in Table 13**.**

A full summary of the vegetation communities assessed is provided in **Appendix F** and provided as a map in **Appendix O.**

Table 13: High and Very High value vegetation types present within the Proposed Designation.

Identification Code	Vegetation Type	Area (ha)	Ecological Value
V1_74	Kahikatea forest	0.44	Very High
V1_84	Kahikatea forest	0.57	Very High
V1_144	Kahikatea-pukatea forest/native scrub/tradescantia	2.54	Very High
V1_214	Kahikatea-kauri-totara treeland	1.61	Very High
V1_219	Kauri-podocarp forest	2.82	Very High
V1_226	Kohekohe-taraire-tawa-podocarp/broadleaf	5.45	Very High
V1_227	Kauri-podocarp forest	4.92	Very High
V1_228	Kauri-podocarp forest	2.30	Very High
V1_231	Kānuka forest	7.25	Very High
V2_4	Kohekohe-taraire-tawa-podocarp/broadleaf	2.15	Very High
V2_35	Kohekohe-taraire-tawa-podocarp/broadleaf	17.06	Very High
V2_39	Kohekohe-taraire-tawa-podocarp/broadleaf	19.21	Very High
V3_15	Kauri-podocarp forest	11.74	Very High
V4_57	Kānuka forest	7.50	Very High
V4_61	Kānuka forest	0.43	Very High
V4_62	Kānuka forest	6.04	Very High
V4_63	Kauri-podocarp forest	1.65	Very High
V4_64	Kānuka forest	17.00	Very High
V4_66	Kānuka forest	13.52	Very High
V4_68	Kānuka forest	0.03	Very High
V4_72	Kānuka forest	0.04	Very High
V4_112	Kānuka forest	0.10	Very High
V4_114	Kauri-podocarp forest	0.95	Very High

Identification Code	Vegetation Type	Area (ha)	Ecological Value
V1_66	Kahikatea treeland	0.51	High
V1_71	Kahikatea treeland	0.28	High
V1_72	Kahikatea treeland	0.12	High
V1_76	Kahikatea treeland	1.20	High
V1_77	Kahikatea treeland	0.34	High
V1_79	Remnant Riparian podocarp-hardwood-kanuka treeland	2.30	High
V1_83	Kahikatea treeland	0.31	High
V1_85	Kahikatea treeland	0.28	High
V1_87	Kahikatea treeland	0.40	High
V1_114	Remnant Riparian podocarp-hardwood-kanuka treeland	2.78	High
V1_159	Remnant Riparian podocarp-hardwood-kanuka treeland	7.66	High
V1_175	Tōtara forest/native broadleaf scrub	1.46	High
V2_1	Kānuka forest	0.76	High
V2_3	Broadleaved species scrub forest	8.33	High
V2_7	Kohekohe-taraire-tawa-podocarp/broadleaf	0.97	High
V2_8	Kānuka forest	0.25	High
V2_27	Broadleaved species scrub forest	1.24	High
V2_37	Kohekohe-taraire-tawa-podocarp/broadleaf	2.83	High
V2_41	Kānuka forest	0.45	High
V2_42	Kānuka forest	3.00	High
V2_43	Kānuka forest	0.65	High
V3_27	Tōtara-kauri/broadleaf scrub	1.87	High
V3_29	Tōtara-kauri/broadleaf scrub	0.43	High
V3_39	Tōtara-kauri/broadleaf scrub	1.32	High
V4_59	Kauri-podocarp forest	0.08	High
V4_105	Tōtara-kauri/broadleaf scrub	0.34	High
V4_121	Kohekohe-taraire-tawa-podocarp/broadleaf	1.88	High

Threatened plants

Our surveys confirmed two Threatened and five At Risk – Declining plant species within the Proposed Designation, which we have assessed respectively as of Very High and High ecological value. Additionally, we confirmed three At Risk – Naturally Uncommon species and assessed them as of Moderate ecological value. Ramarama (Threatened – Nationally Critical; Very High value) was not recorded during the surveys but based on the vegetation types present and a recent record in the Brynderwyn Hills during the Brynderwyn Recovery Project, we have assumed it may be present within mature native forest in the Brynderwyn Hills.

4.2.2. Lizard Ecological Values

Our baseline survey confirmed the presence of one species of native lizard: At Risk- Declining copper skink which are of High ecological value based on the criteria specified in Table 2. The low densities of lizards found is likely influenced by historical modification of many of the habitats, and presence of a range of predators within the Proposed Designation.

Copper skinks are widely distributed throughout the North Island and are frequently recorded within indigenous forest, piles of woody debris and in highly modified habitats such as rank grassland, exotic scrub, and urban environments. We recorded fifteen confirmed copper skinks within the northern part of the Proposed Designation and one copper skink within the southern part of the Proposed Designation. They are also likely present within other suitable habitats within the Proposed Designation.

Native lizards have a Cryptic nature and are well camouflaged, making them difficult to detect, particularly when present at low densities or within complex habitats. Based on our desktop assessment and other

field investigations, we consider five additional native lizard species recorded within 15 km of the Proposed Designation are potentially present within habitats in the Proposed Designation, even though they were not detected during our surveys for this Project. These species include the At Risk – Declining elegant gecko, forest gecko, and ornate skink, all of which we have assessed as having High ecological value, and the Not Threatened Pacific gecko, which we have assessed as having Moderate ecological value (see Table 10).

4.2.3. Hochstetter's Frog Ecological Values

Our desktop study and baseline surveys confirmed the presence of Hochstetter's frog. The conservation status of Hochstetter's frog is At Risk – Declining (Burns et al. 2025) therefore its ecological value is assigned as High based on the factors listed in Table 2.

Hochstetter frogs are distributed across the northern North Island in 11 distinct regional populations, found predominantly within high quality habitat streams in large contiguous areas of pristine indigenous forest. Hochstetter's frog found in the Proposed Designation belongs to the Northern clade of Hochstetter frog, known as Leiopelma aff. hochstetteri "Northland" sensu (Newman et al., 2013) which includes populations found within the Waipu, Brynderwyn and Warkworth regions. This genetically distinct population of Hochstetter's frog is the most northern population and has an estimated population size of up to 20,000 mature individuals and has been assigned an At-Risk – Declining threat status due to their estimated trending 10-30% decline in population (Burns et al. 2025). This decline is thought to be mainly due to the impact of introduced predatory mammals, though habitat loss, floods, droughts, and climate change may also contribute.

Overall, the ecological value of Hochstetter's frogs, found in low to high quality habitat across Zones 1 and 2 is High.

4.2.4. Long-tailed Bat Ecological Values

Long-tailed bats are present within the Proposed Designation and the wider landscape. However, activity levels recorded along the Proposed Designation were very low with detections limited to areas north and south of the Brynderwyns Hills.

Long-tailed bats have a 'Threatened - Nationally Critical' conservation status (C. O'Donnell et al., 2023), therefore we have assessed the ecological value of long-tailed bats as Very High.

As High potential bat roosting habitat and High potential bat habitat is present throughout the Proposed Designation and bats have been confirmed utilising sites throughout the earthworks Zones, the overall ecological value of habitats within the Proposed Designation is assessed as Very High.

Table 14 provides an assessment of the ecological value of bat habitats within each Earthworks Zone.

Table 14: Ecological value of habitats for long-tailed bats, categorised by Earthworks Zones.

Zone	Ecological value of habitats	Justification for value
1	High	Dominated by pasture with scattered indigenous forest remnants, riparian corridors, and exotic shelterbelts and hedgerows that provide both High potential bat roosting habitat and High potential bat habitat. Immediate connectivity to the Ahuroa River and Waihoihoi River and its tributaries providing important foraging and commuting habitat. Very low bat activity with detections restricted to the southern end of the Zone. Bat activity patterns indicate that bats are primarily foraging and commuting through the landscape in this Zone, with possible roosting occurring in nearby trees.
2	Very High	Large contiguous tracts of indigenous and exotic vegetation within the Brynderwyns Hills Complex. Both High potential bat roosting habitat and high potential bat habitat present with immediate connectivity to extensive indigenous and exotic forest blocks to the east and west of the Proposed Designation. Very low bat activity with detections restricted to the southern end of the Zone. Bat activity patterns indicate that bats are primarily foraging and commuting through the landscape in this Zone.

3	Very High	Dominated by pasture with large contiguous remnants of native and exotic vegetation that provide both High potential bat roosting habitat and high potential bat habitat. Several permanent streams, wetlands, and a pond are present which are likely to provide valuable foraging habitat, and there is connectivity to indigenous and exotic forest blocks to the east of the Proposed Designation. Very low bat activity with bat activity patterns indicating that bats are primarily foraging and commuting through the landscape in this Zone, with possible roosting occurring in nearby trees.
4	High	Scattered exotic and indigenous vegetation amongst open pasture that provide High potential bat roosting habitat and areas of High potential bat habitat. Immediate connectivity between extensive indigenous forest blocks to the east and west of the Proposed Designation. Very low bat activity detected at one site, with activity patterns indicating that bats are primarily foraging and commuting through the landscape in this Zone.

4.2.5. Terrestrial Invertebrate Ecological Values

The two land snail species with a conservation threat classification of At Risk – Declining hold High ecological value, while other indigenous Not Threatened invertebrate species hold Low ecological value (Table 15).

Table 15: Ecological value of Threatened, At Risk and notable terrestrial invertebrate species confirmed within the Proposed Designation. Threat classifications are derived from Walker et al. (2023) and Trewick et al. (2018).

Scientific name	Common name	Māori Name	Threat classification	Ecological value
Amborhytida dunniae	Rhytid snail		At Risk – Declining	High
Paryphanta busbyi	Kauri snail	Pupurangi	At Risk – Declining	High
Arachnocampa luminosa	Glow worms		Not Threatened	Low
Peripatoides sympatrica	Peripatus		Not Threatened	Low

4.3. Assessment of actual and potential effects

4.3.1. Vegetation

The potential effects of the Project on vegetation are:

- Direct loss of 39 ha of indigenous dominated vegetation, approximately 3.3 ha of which consists of riparian margin vegetation.[5]
- Direct loss of 60 ha of exotic dominated vegetation, approximately 8.5 ha of which consists of riparian margin vegetation.
- Direct loss of all 99 ha of vegetation (indigenous and exotic dominant) by Ecological Value is:
  - Very High: 18 ha
  - High: 7 ha
  - Moderate: 4 ha
  - Low: 12 ha (2 ha consists of commercial forestry)
  - Negligible: 59 ha (47 ha consists of commercial forestry)
- Permanent loss of At Risk or Threatened plants.
- Habitat fragmentation of contiguous tracts of indigenous vegetation and existing indigenous vegetation remnant, reducing habitat connectivity and further isolating indigenous forest remnants.
- Reduction of habitat connectivity from fragmentation, which will potentially affect the dispersal of plants through the landscape.

[5] Within 10 m of a natural wetland, or within 10 m of the bed of a continually or intermittently flowing river or lake.

- Creation of new edges from the modification of microclimate conditions, affecting vegetation composition and structure. Edge effects have the potential to increase weed invasions along edges and along the road corridors. Operational effects such as the usage of herbicides or other associated road maintenance activities may also exacerbate edge effects.
- Potential spread of plant pathogens and pests due to construction activities from direct construction activities, earthworks, or stormwater runoff.[6]

A summary of all vegetation lost by type within the Proposed designation is provided in Table 16, while Table 17 outlines the unmitigated level of effects on vegetation impacted.

Table 16: Vegetation loss (ha) (by type) within the Proposed Designation.

Vegetation type	Area lost (ha)
Anthropic totara forest	2.5
Broadleaved species scrub forest	3.8
Crack willow/mixed exotic and native shrub/exotic groundcover	7.7
Crack willow-exotic trees-remnant native trees/mixed exotic and native shrub	0.05
Eucalyptus treeland/ranked grassland	0.3
Exotic pine forest/mixed native and exotic scrub/ranked grassland	49.7
Exotic pine forest/native broadleaf scrub	-
Gorse shrubland	0.0007
Japanese cedar hedgerow	0.3
Kahikatea forest	0.4
Kahikatea treeland	0.6
Kahikatea-kauri-totara treeland	0.3
Kahikatea-pukatea forest/native scrub/tradescantia	0.6
Kānuka forest	10.4
Kānuka treeland/native and exotic scrub/ranked grassland	3.1
Kauri-podocarp forest	1.5
Kohekohe-taraire-tawa-podocarp/broadleaf	8.2
Lawson's cypress-exotic pine treeland	0.2
Macrocarpa/mixed native and exotic scrub/ranked grassland	0.2
Mixed exotic-native scrub and hedgerow scrub	0.03
Mixed tall exotic shelterbelt treeland	0.2
Nīkau treeland	0.07
Ornamental plantings and gardens	1.2
Planted native vegetation	4.2
Poplar treeland/exotic scrub/ranked grassland	0.6
Pūriri forest/ranked grassland	0.306
River she-oak hedgerow	0.3
Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland	0.3
Tōtara forest/native broadleaf scrub	1.2
Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland	1.1
Tōtara-kauri/broadleaf scrub	0.8

[6] Following Kauri Hygiene Standard Operating Procedures, this is assumed to be suitably managed.

Table 17: Magnitude and overall level of unmitigated effects on vegetation within the Proposed Designation. Mitigation (outlined in Section 5) is recommended for the effects shown in bold.

Potential Effects	Ecological component	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
Permanent Effects				
Vegetation community loss	Vegetation types	Very High	High – Direct loss of 18 ha	**Very High**
		High	High – Direct loss of 7 ha	**High**
		Moderate	Moderate – Direct loss of 4 ha	Moderate
		Low	Moderate – Direct loss of 12 ha (2 ha commercial forest)	Low
		Negligible	High – Direct loss of 59 ha (47 ha commercial forest)	Low
Direct Threatened or At Risk plant specimen loss	M. complexa var. grandifolia	High	Low – Direct loss of two specimens. Small proportion of loss compared to the population in the wider landscape. The species is likely to be overlooked and more common than what has been observed.	Low
	Kauri	High	High – Direct loss of several mature kauri groves (approximately 40 individuals). A significant proportion of kauri loss within the local landscape.	**Very High**
	Mairehau	High	Low – Direct loss of one mature specimen. Small proportion of the population within the local landscape.	Low
	Maire Taiki	High	Low – Direct loss of two specimens. Small proportion of the population within the local landscape.	Low
	Mokimoki	Moderate	Low – Direct loss of one specimen. Small proportion of the population within the local landscape.	Low
	Giant Hypolepis	Moderate	Low – Direct loss of three specimens. Small proportion of the population within the local landscape. Locally common beside disturbed forestry tracks.	Low
Indirect effects to Kauri	Kauri	High	Moderate –The pathogen could be inadvertently spread to new sites during construction, particularly retained kauri stands near construction areas, as it is carried in soil moved by boots, tyres, equipment, and machinery.	**High**
Habitat fragmentation and edge effects	Vegetation types	Very High	High – The understories of these mature indigenous forests develop in undisturbed conditions with dense canopy cover, leaf litter, and moisture retention which produces unique microclimates and soil conditions that do not occur near the forest edge and are essential to the continued recruitment of these deep forest species. The fragmentation caused by the proposed works will increase the edge-to-interior ratio and may lead to long term gradual retraction of these species from the newly imposed margin.	**Very High**
		High	High – As per Very High valued vegetation, similar effects are expected.	**Very High**

Potential Effects	Ecological component	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
		Moderate	Low – Many of these vegetation patches are of a smaller footprint and are already fragmented or isolated by surrounding pasture. The floral composition of these habitats was indicative of already being subjected to strong edge effects. Accordingly, further fragmentation or reduction in size caused by the Project will likely not significantly alter the composition of the vegetation that is retained.	Low
		Low	Low – The vegetation types are highly modified, fragmentated and subjected to edge effects already. The degree of change from baseline conditions is assessed as Low	Very Low
		Negligible		Very Low

4.3.2. Lizards

The potential effects of the Project on native lizards are:

- Direct loss of potential high value (At Risk lizard) habitat;
- Habitat fragmentation and edge effects;
- Injury or death during habitat removal;
- Disturbance: noise, vibration, & lighting.

A detailed assessment of the unmitigated magnitude and level of effects on lizards for each of the above potential effects is provided in Table 18 below

Although suitable habitat exists for up to six native lizard species within the Proposed Designation, only one species, copper skink, has been confirmed on site. Accordingly, the effects assessment has been separated into two components. The first addressing effects on copper skink, and the second addressing effects on other native lizard species that are potentially present but have not been confirmed on site during field surveys.

Given the uncertainty regarding the presence, distribution, and population size of these unconfirmed native lizard species, a precautionary range of potential effect levels has been considered. The Proposed Designation represents a very small proportion of the known or potential distributions of these other native lizard species. No populations, notable habitats, or “hot spots” for these species were identified during the desktop assessment, or during detailed field surveys within the Proposed Designation. Applying the EIANZ EcIA guidelines, which assesses effects based on the value of the ecological feature and the magnitude of effect, professional judgement has been used to conclude that the unmitigated magnitude of effect on unconfirmed lizard species is likely to be negligible to low (Roper Lindsay et al., 2018).

This conclusion is supported by desktop assessment, survey results to date, the footprint of works relative to the species’ broader distributions, and the current absence of evidence for locally, regionally or nationally important populations. Further evidence is provided by outcomes from the adjacent Brynderwyn Hills recovery project (WSP, 2024b), where intensive searches in nearby, high quality comparable habitat identified only a single copper skink and no other lizard species during lizard salvage using best practice methodologies including stockpiling of felled trees and spotlighting the stockpiles for arboreal lizards.

While some uncertainty remains, and it is acknowledged that other native lizard species may be present but undetected, reliance on professional judgement is considered appropriate in this case. It is not anticipated that residual adverse effects on other native lizard species (i.e. species other than copper skink) will occur. However, it is considered that any residual effects arising from incorrect assumptions can be captured and managed through the Wildlife Act Approval (WAA) conditions, which require the preparation and implementation of lizard management as part of a broader Ecological Management Plan (EMP).

The EMP will provide for the appropriate management of any native lizard species that may be encountered during works, including salvage and relocation procedures, supported by accidental discovery protocols. As such, any effects on unconfirmed lizard species would be mitigated through these measures. In addition, mitigation measures proposed for adverse effects on copper skink, including salvage and relocation, enhanced release sites, habitat enhancement, pest control, and ongoing management are also suitable for other native lizard species should they be present. It is expected that should there be unconfirmed residual effects on other lizard species, the mitigation proposed for copper skink shall be able to capture and provide effective mitigation for these other species as well.

Overall, based on the available evidence, we consider it likely that population densities of other native lizard species within the Proposed Designation (if present at all) would be low. Any unassessed and unconfirmed potential effects on these species can be effectively managed through the proposed mitigation measures for copper skink, the Ecological Management Plan (EMP) and LMP, and compliance with WAA conditions.

In summary the magnitude of effects of the Project on native lizards is Negligible – Moderate and the overall level of effects **Very Low – High**. For copper skink specifically, which are confirmed on site, the overall level of effect ranges from **Low – High** as outlined in Table 18.

Table 18: Magnitude and overall level of unmitigated effects on lizards. Mitigation (outlined in Section 5) is recommended for those effects shown in bold

Potential Effects	Species	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
Permanent Effects				
Habitat loss	Copper skink	High	Moderate – A large area of habitat, including a high proportion of edge habitat, will be removed. This is balanced by the low density of copper skinks recorded on site. Habitat loss can lead to displacement, with lizards forced to seek resources elsewhere. This may increase competition with resident lizards, potentially resulting in mortality where habitat is already occupied. Displacement into unfamiliar areas can also increase vulnerability to predation. While a low magnitude of effect can be applied to pasture-dominated vegetation, because only a small proportion of this habitat will be affected relative to the wider connected landscape, a moderate magnitude applies to higher quality- skink habitat where a larger proportion of suitable habitat will be impacted.	**High**
	At Risk Declining and Not Threatened lizard species not confirmed on site	Moderate - High	Negligible-Low – As no individuals were detected during surveys, it is unlikely that all five potential species are present, and any that are present are expected to occur at very low densities. This uncertainty makes it difficult to determine the scale of habitat loss effects, which will depend on their actual distribution and population size.	Very Low-Low
Habitat fragmentation	Copper skink	High	Moderate – Once operational, the road will create a permanent barrier to movement, isolating individuals or subpopulations. This reduces opportunities for dispersal and breeding and may increase predation risk by providing greater predator access to fragmented habitat. Effect is partly reduced for copper skink because they are considered seminomadic, occupying very small temporary home ranges with high site fidelity before moving, sometimes over considerable distances, to establish a new small home range. Consequently, effects are lower in pasture dominated areas where copper skinks were frequently encountered, and only small proportions	**High**

Potential Effects	Species	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
			of habitat will be affected relative to the wider connected landscape.	
	At Risk Declining and Not Threatened lizard species	Moderate - High	Negligible-Low – As no individuals were detected during surveys, it is unlikely that all five potential species are present, and any that are present are expected to occur at very low densities. This uncertainty makes it difficult to determine the scale of fragmentation effects, which will depend on their actual distribution and population size Of note: if present, geckos typically exhibit high site fidelity, small home ranges, and low mobility, particularly in fragmented habitats, making them more sensitive to habitat fragmentation	Very Low -Low
Operational disturbance	Copper skink	High	Low – New road increases risk of vehicle strike that can injure or kill lizards crossing roads. Increase in regular noise, vibration, and lighting with new road, however, copper skinks are known to persist on the verges of busy roads	Low
	At Risk Declining and Not Threatened lizard species	Moderate - High	Negligible-Low – As above. Of note, geckos have high site fidelity within small home range reduces risk of vehicle strike.	Low
Temporary - Construction Phase / Short to Medium term				
Injury or death during habitat removal and displacement.	Copper skink	High	Moderate – Vegetation / habitat clearance and earthworks can cause in injury and death to lizards. Low mobility increases level of risk; however, densities are low reducing likelihood. Potential reduced local population size and population resilience. Lizards not detected during salvage may be displaced increasing predation and resource pressure.	**High**
	At Risk Declining and Not Threatened lizard species	Moderate - High	Negligible-Low – As above. Low detectability increases level of risk; however, if present densities are likely-very low in some areas reducing likelihood of an impact	Very Low-Low[7]
Indirect construction disturbance (noise, light, vibration and dust)	Copper skink	High	Low – Noise, vibration, lighting and dust could adversely affect native lizards in nearby habitat. Excessive dust covering surrounding habitats reduces habitat quality and direct disturbance light (although it is assumed there will be very little work at night), noise and vibrations from machinery may results in avoidance/displacement and impact the ability of native lizards to detect and catch prey and find mates.	Low
	At Risk Declining and Not Threatened lizard species	Moderate - High	Negligible-Low – Same as above.	Very Low-Low

4.3.3. Frogs

The potential effects of the Project on Hochstetter's frogs are:

[7] Due to uncertainty of the species presence and hence the level of magnitude of effect, profession judgement (as allowed in the EIANZ EcIA guidelines) was used to judge that effects are likely to be very low to low based on the evidence available to date.

- Direct loss approximately 3.85 km of High Quality Hochstetter's frog habitat.
- Direct loss of approximately 10.3 km of Low to Moderate Quality Hochstetter's frog habitat.
- Indirect habitat loss and reduction in remaining habitat quality due to habitat fragmentation effects and associated edge effects.
- Direct disturbance to Hochstetter's frogs resulting in potential injury or death during habitat removal.
- Reduction in habitat quality due to sediment and other contaminants from construction.
- Construction disturbance (noise, vibration, blasting).
- Operational disturbance (noise, vibration, Artificial Light at Night (ALAN)).

Published evidence has demonstrated that the abundance of Hochstetter's frogs present within exotic forestry plantations declines substantially when the forest is harvested (Crossland, MacKenzie, & Holzapfel, 2005). While declines of around 90% have been suggested, actual declines are likely to be influenced by site-and project-specific factors such as harvest methodology and riparian protection. It is expected that the Zentral Pine Plantation will be harvested via standard forest harvesting practices prior, and separate to, the construction of the Project. As such it is expected that Hochstetter frog populations will be reduced by up to 90 percent in areas of exotic forest/pine plantation and therefore in our assessment we have adjusted the potential absolute density of frogs in these areas first by a ratio of 1:8.2 (to account for potentially present, but not recorded during surveys, frogs) and then subsequently decreased by 90 percent (to account for the removal of the plantation forest prior to Project construction). The total adjusted number of potential individual Hochstetter's frogs impacted by the Project can be seen in Table 19 below.

Table 19: Estimated quantitative effects on Hochstetter's frogs due to Project construction.

Classification	Length of Stream Habitat loss to construction (km)	Relative Surveyed Frog Density (per 100 m)	Adjusted[8] Frog Density (per 100 m)
Exotic Forest[9] Stream Habitat - Low to Moderate Quality	10.3	6.7	5.5
Fragmentation of Exotic Forest Stream Habitat - Low to Moderate Quality	3.2	6.7	5.5
Indigenous Vegetation Stream Habitat - High Quality	3.9	50.8	416.6
Fragmentation of Indigenous Vegetation Stream Habitat - High Quality	3.7	50.8	416.6
Total Frog Stream Habitat	14.2	-	-
Total Fragmentation of Stream Habitat	6.8	-	-

A map showing the loss and fragmentation of stream frog habitat as a result of the construction of the indicative alignment is attached in **Appendix P**. A detailed assessment of the unmitigated magnitude and level of effects on Hochstetter's frogs for each of the Project's potential effects is provided in Table 20 below[10].

In summary, the unmitigated magnitude of effects of the Project on Hochstetter's frogs is High, and the overall unmitigated level of effects is **Very High.**

[8] Adjusted value is the estimated density of frogs present. The adjusted value is calculated using the survey value and adjusted it based on a 90% reduction in harvested commercial forestry and a 1:8.2 ratio of surveyed to actual number of frogs present.
[9] Removal of commercial forest in accordance with NES -CF, and the level of effect of that activity on frogs has been discounted in the final overall impact on frogs attributable to the Project.
[10] [sic]

Table 20: Magnitude of and overall level of unmitigated effects on Hochstetter's frogs. Mitigation (outlined in Section 5) is recommended for those effects shown in bold.

Potential Effects	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
Permanent Effects			
Habitat loss	High	High – 14.2 km stream length of permanent loss, comprised mostly of moderate to high quality stream habitat where Hochstetter's frogs are recorded.	**Very High**
Habitat Fragmentation	High	High – Once operational, the road will create one way movement through culverts on either side of the road. This isolates individuals/populations, reduces the ability to disperse and breed. Sections of stream that cumulatively total up to 6.8 km of Hochstetter's frog habitat in Zone 1 and 2 will be effectively isolated from the surrounding areas due to the fragmentation caused by construction. Within the Brynderwyns Outstanding Natural Landscape (ONL) in particular, where the highest quality frog habitat occurs along the Indicative Alignment, a number of streams will be completely severed and the remaining habitat upstream of the new road, in some cases, will be insufficient to retain a viable frog population. The fragmentation will prevent access to high quality breeding/nesting habitat for downstream populations.	**Very High**
Indirect habitat loss and degradation via habitat fragmentation and edge effects	High	Moderate – Degradation of frog habitat immediately adjacent to impacted stream via edge effects and general disturbance. Specifically, Hochstetter's frog require stable, cool, moist, and shaded riparian habitats. The creation of new edges results in changes to microclimates such as increased light, temperatures, wind, and desiccation and is prone to weed invasion.	**High**
Operational disturbance	High	Low – Increase in regular noise, vibration, and lighting with new road. This would likely result in some degree of avoidance where Hochstetter's frogs are present. Frogs are known to persist on the verges of busy roads, but high site fidelity increases impacts at some locations. Contamination and reduced water quality associated with stormwater runoff and changes in hydrology within watercourses due to additional impervious surfaces and associated increased runoff within watercourses. Construction cuts also have the ability to impact groundwater and hydrology within the watercourses where frogs are present. These all have the potential to displace frogs and reduce the availability of high-quality habitat within streams. Hochstetter's frogs are primarily Nocturnal and any permanent ALAN around habitat may either make these areas unsuitable for frogs or increase predation chances for frogs in these areas.	Low
Temporary - Construction Phase / Short to Medium term			
Injury or death during habitat removal and displacement with increase predation and resource pressure	High	High – The removal of Hochstetter's frog habitat during construction has a very high risk of injury and / or death of frogs. The loss of Moderate and High quality habitat, in particular the high value low flow/breeding headwater streams in the ONL, is likely to displace frogs into less suitable habitat with naturally lower carrying capacity, increase predation chance and / or decrease breeding success. This results in high magnitude of effects with the potential to impact local population survivability.	**Very High**

		The low mobility of Hochstetter's frogs significantly increases the risk of injury or death.	
Indirect construction disturbance such as sedimentation, concrete, noise, dust, blasting and vibration.	High	High – Sedimentation: adverse effects of clogging of refuges and interstitial space, shifts in suitability of prey and displacement. Streams particularly vulnerable in locations of low flows where generally higher abundance of frogs recorded. Concrete: cement can rapidly alter pH levels to become highly alkaline and can suffocate and cause severe burns to frogs. Streams particularly vulnerable in locations of low flows where generally higher abundance of frogs recorded. Noise: vibration, lighting and dust could also adversely affect native frogs in nearby habitat resulting in some level of avoidance/displacement with reduced habitat quality. However, this is likely to be a Low magnitude of effect.	**High**

4.3.4. Bats

The potential effects of the Project on bats are:

- Direct loss of 163 ha of High potential bat habitat (roosting, foraging, and commuting), of which 49 ha is commercial pine forestry;
- Habitat fragmentation;
- Injury or death during vegetation removal;
- Mortality by vehicle collision;
- Construction disturbance (noise, vibration, lighting); and
- Operational disturbance (noise, vibration, lighting).

A detailed assessment of the unmitigated magnitude and level of effects on bats for each of the above potential effects is provided in Table 21 below.

In summary the magnitude of effects on Long-tailed bats is Moderate - Very High, and the overall level of effects **Moderate-High**.

Table 21: Magnitude and overall level of unmitigated effects on bats. Mitigation (outlined in Section 5) is recommended for effects in bold

Potential Effects	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
Permanent Effects			
Habitat loss	Very High	Low – The Project will result in the loss of some bat habitat (roosting, foraging, and commuting) with the greatest extent of loss anticipated in Zone 2, and Zone 4 where the Indicative Alignment intersects large native and non-commercial exotic forest blocks. There may also be localised changes in potential foraging habitat throughout the Proposed Designation as some stream and wetland habitats are likely be directly impacted by culvert installation, realignments and reclamation, and indirectly impacted by reduced baseflows from construction cuts, which may alter stream food webs and decrease invertebrate availability for long-tailed bats. However, some bat habitat will be retained and there is an abundance of similar habitats within the wider landscape that will not be impacted by the Project, therefore the overall habitat loss will have a minor effect on the population range.	**Moderate**
Habitat fragmentation	Very High	Moderate – Habitat loss as a result of the Project will lead to fragmentation of the landscape and spatial isolation which may cause population and resource pressures. In addition, the introduction of road noise and light may lead to behavioural avoidance and displacement of bats from the area. The most significant	**High**

Potential Effects	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
		fragmentation effects from the Project are expected in Zone 2 and Zone 4, where the Indicative Alignment intersects large native and non-commercial exotic forest blocks Additional, fragmentation effects may occur within the southern end of Zone 1 and in Zone 3, where the Indicative Alignment intersects indigenous forest remnants where most of the bat activity occurred. Most of the landscape within the Proposed Designation is already highly modified due to the existing SH1 and historical land clearance for farming activities. Therefore, further fragmentation effects in this area may have significant impacts on the local bat population.	
Mortality by vehicle collision	Very High	Low – The construction of the Project will result in a physical change to the landscape which may increase the risk of long-tailed bats colliding with vehicles. This risk is likely minimal in the northern section of Zone 1 where bats were not detected, however, the risk could be highest in the southern Zone 2, 3 and 4. In addition, given the overall low activity, the loss of an individual bat could impact the local populations survivability. However, recent research in New Zealand has shown bat activity decreased in areas with increased light, traffic noise, and traffic volume likely due to behavioural avoidance. As a result, the likelihood of long-tailed bats colliding with vehicles is expected to be low.	**Moderate**
Operational disturbance (noise and lighting)	Very High	Moderate – Long-tailed bats are known to alter their flight paths and behaviour in response to artificial lighting and traffic noise. As a result, operational disturbance may exacerbate fragmentation and reduce the suitability of adjacent foraging habitats. These effects are expected to be most pronounced in Zones 2, 3, and 4 where headlight glare and road noise will be exacerbated. Given the local population may already be subject to headlight glare and road noise along the existing SH1, they may adapt and fly above the road corridors, in turn reducing the likelihood of vehicle collisions and exacerbating fragmentation.	**High**
Temporary - Construction Phase / Short to Medium term			
Injury or death during vegetation removal	Very High	High – The removal of potential roost habitat means there is a risk of felling vegetation while long-tailed bats are actively roosting. This would likely result in injury and / or death to long-tailed bat(s). In addition, given the overall low activity, the loss of an individual bat could impact the local populations survivability.	**Very High**
Indirect construction disturbance (noise, lighting, and vibration)	Very High	Low – Construction activities increase noise, vibration, and in some instances lighting to the surrounding areas which may disrupt long-tailed bat behaviour by either causing them to abandon roosts or emerge later than is considered optimal for foraging. There is High-potential bat roost habitat throughout the Proposed Designation, and the temporal activity patterns indicated that bats may be roosting in areas where construction activities will occur. However, bat activity was very low, and construction effects will be localised and temporary.	**Moderate**

4.3.5. Invertebrates

The potential effects of the Project on At Risk – Declining and Notable native invertebrates confirmed to be present within the Proposed Designation are:

- Direct loss of potential habitat for kauri snail, *A. dunniae* (High value) and peripatus (Low value) (see Table 15).
  - All forested native and exotic vegetation types are assumed as potential habitat for High value invertebrate species and peripatus
  - The areas of exotic forestry have been included as potential habitat for kauri snails, *A. dunniae* and peripatus populations are likely to persist in exotic plantations post-felling.

- Direct loss of potential habitat for glow worms (Low value)
- Indirect habitat loss and reduction in remaining habitat quality due to habitat fragmentation and associated edge effects; and
- Injury or death during habitat removal.

A detailed assessment of the unmitigated magnitude and level of effects on At Risk – Declining and Notable native invertebrates for each of the Project's potential effects is provided in Table 22 below.

Table 22: Magnitude and overall level of unmitigated effects on invertebrate species. Mitigation (outlined in Section 5) is recommended for those effects shown in bold

Potential Effects	Species	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
Permanent Effects				
Habitat loss	At Risk – Declining species (Kauri snail and *A. dunniaie*)	High	Moderate – A large area of habitat and high proportion of the local landscape to be removed, balanced by low density of snails present in most of the designation.	**High**
	Notable species (peripatus and glow worms)	Low	Moderate – A large area of habitat and high proportion of the local landscape to be removed, balanced by low density of peripatus likely present in most of the designation.	Low
Indirect habitat loss and degradation via habitat fragmentation and edge effects	At Risk – Declining species	High	Moderate – Snails are particularly vulnerable to edge effects due to the impacts of being relatively immobile and threat of drying. Once operational the road will create a complete barrier to snail movement between habitats on either side of the road. This isolates individuals/populations, reduces the ability to disperse and breed, and increases predation as pests have greater access to snail habitat.	**High**
	Notable species	Low	Low – Although glow worms have a mobile adult stage, they are poor fliers. There is limited suitable habitat within the Proposed Designation which will be bisected by the road. Effects on peripatus are similar to snails as they are vulnerable to edge effects and the road will create a barrier to their movement.	Low
Operational disturbance	At Risk – Declining species	High	Low – A new road increases risk of vehicle strike that can injure or kill individuals crossing roads. High site fidelity within small home range reduces risk. Increase in regular noise, vibration, and lighting with an additional road expected to result in some degree of avoidance.	Low
	Notable species	Low	Low – as above.	Low
Temporary - Construction Phase / Short to Medium term				
Injury or death during habitat removal and displacement	At Risk – Declining species	High	Moderate – Vegetation / habitat clearance and earthworks can cause injury and death to snails. Low mobility and detectability increase level of risk; however, densities are low in some areas reducing likelihood of an impact Potential impacts are reduced local population size and population resilience.	**High**
	Notable invertebrates	Low	Moderate – Vegetation / habitat clearance and earthworks can cause in injury and death to invertebrates. Low mobility and detectability increase level of risk. Densities	Low

Potential Effects	Species	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect
			are likely low for peripatus reducing likelihood. Potential reduced local population size and population resilience.	
Construction disturbance	At Risk – Declining species	High	Low – Construction works include the use of heavy earthworks machinery, truck movements, and night works. Noise, vibration, lighting and dust could adversely affect snails in nearby habitat.	Low
	Notable invertebrates	Low	Low – As above.	Low

5. Recommended Mitigation

We have assessed habitat values, individual species and species assemblages as having pre-mitigated level of effects ranging from Very Low – High as detailed in Section 4 above.

We recommend mitigation actions[11] to avoid, minimise or remediate effects that we have assessed as being 'Moderate' or higher.

Table 23 summarises the effects on ecological features that we have assessed as having 'Moderate' or higher effects and our key recommended mitigation actions for each effect. Further detail, where needed, for the recommended mitigation action is included in the Sections below.

Table 23: Recommended mitigation actions for effects on ecological features.

Effect	Ecological feature	Mitigation
Permanent loss of habitat/vegetation and Permanent habitat fragmentation	Native vegetation types of Very High, High and Moderate value (direct loss of 29 ha in total) Native lizard habitat Hochstetter's frog habitat Long-tailed bat habitat Kauri snails and *A. dunniae* habitat	Minimisation of loss, where practicable, of native vegetation and native fauna species habitat through detailed design and construction methodology. Mitigation planting and enhancement of existing vegetation at the three potential "Mitigation and Release Sites" (See Section 5.1), to increase the area of native forest, provide alternative habitat and reduce fragmentation effects. Retain/install bat hop-overs (bats only).
Permanent loss of Threatened or At Risk plant specimens	Kauri trees	Minimisation of loss, where practicable, of kauri trees through detailed design and construction methodology. Offset planting at a ratio of 50:1 for kauri trees larger than 50 cm DBH.
Indirect loss or damage via kauri dieback introduction	Kauri trees	Correct application of the Kauri Hygiene Standard Operating Procedures.
Mortality by vehicle collision	Long-tailed bats	Retain/install bat hop-overs.
Operational disturbance (noise and lighting)	Long-tailed bats	Restrictions on the type and intensity of permanent lighting in proximity to bat roost habitat as per the most up to date advice from the New Zealand Bat Recovery Group.
Injury or death during habitat removal and displacement	Native lizards Hochstetter's frogs Kauri snails	Salvage and relocation within appropriate species-specific constraints *(through the WAA approval process).*
	Long-tailed bats	Implementation of DOC's Bat Roost Protocol (BRP).
Indirect Construction disturbance (sedimentation, concrete, noise, lighting and vibration)	Hochstetter's frogs	Implementation of sediment and other contaminant (e.g. concrete) control where works are in proximity to potential frog habitat
Indirect construction disturbance (noise, lighting, and vibration)	Long-tailed bats	Where active roosts are identified, protocols should be implemented until the roost is no longer occupied to reduce the risk of disturbance of roosts and be detailed within the vegetation removal protocols. These should include a 50 m setback area for construction activities around the active roost/s until monitoring can determine that the roost/s are no longer occupied, and prohibiting or limiting construction activities within 50 m from an active roost/s two hours before sunset until one hour after sunrise.

[11] Page 84, Roper-Lindsay et al., (2018) EcIA guidelines.

5.1. Indicative Mitigation Sites

We have proposed up to three potential Mitigation Sites within the Proposed Designation for habitat remediation and enhancement – one north of the Brynderwyn Hills, one within Zentral Forest, and one to the south of the Brynderwyn Hills (shown in the Drawings in **Appendix R**). These sites are described further below. We propose these sites to be managed to mitigate for multiple ecological effects across a range of sensitivities (vegetation, freshwater, wetland, lizards, snails, bats, frog and birds) and could also act as release sites for salvaged fauna. To mitigate for the effects of the Project construction and operation, enhancement of the existing native vegetation and remediation of pasture into native forest to connect the existing patches of native bush within the mitigation sites will seek to:

- increase native forest area;
- reduce fragmentation and edge effects within the sites; and
- enhance the existing habitat through pest control and habitat creation to receive salvaged fauna.

Additionally, a section of the Brynderwyns ONL was identified for pest control following the 2023 Brynderwyn Recovery works. That area will be fragmented by the Indicative Alignment, and we recommend that pest control is undertaken to enhance the remaining habitat to increase the carrying capacity for Hochstetter's frogs and mitigate, in part, for the effects on the native forest in this area.

The three potential mitigation sites allow for co-location of several complementary remediation actions, which together, will provide for greater ecological benefits.

The exact number, extent and location of the sites will be confirmed following detailed design. Conceptual maps have been included for informative purposes only.

5.1.1. Northern Mitigation Site

The "Northern Mitigation Site" (approximately 54.5 ha) is located in the foothills of the Brynderwyn Hills forest complex and is comprised of a large contiguous tract of mature Kauri-podocarp and broadleaf-podocarp forests that is bordered by pastoral hill country and smaller native forest fragments (Figure 1). The Site contains small, forested tributaries in the upper Waihoihoi River valley, which is suitable for Hochstetter's frog. The site contains approximately 7.7 km of Low to High quality stream habitat that is suitable for enhancement and/or frog release site (**Appendix Q**). It also supports copper skink and snail species due to the presence of suitable refugia. This site contains approximately 24.79 ha of existing indigenous vegetation, of which 21.6 ha was assessed as Very High value forest and the remaining 3.2 ha is Low to Moderate. This site provides the opportunity to improve the quality of 3.2 ha of vegetation and convert a further 29.8 ha from pasture.

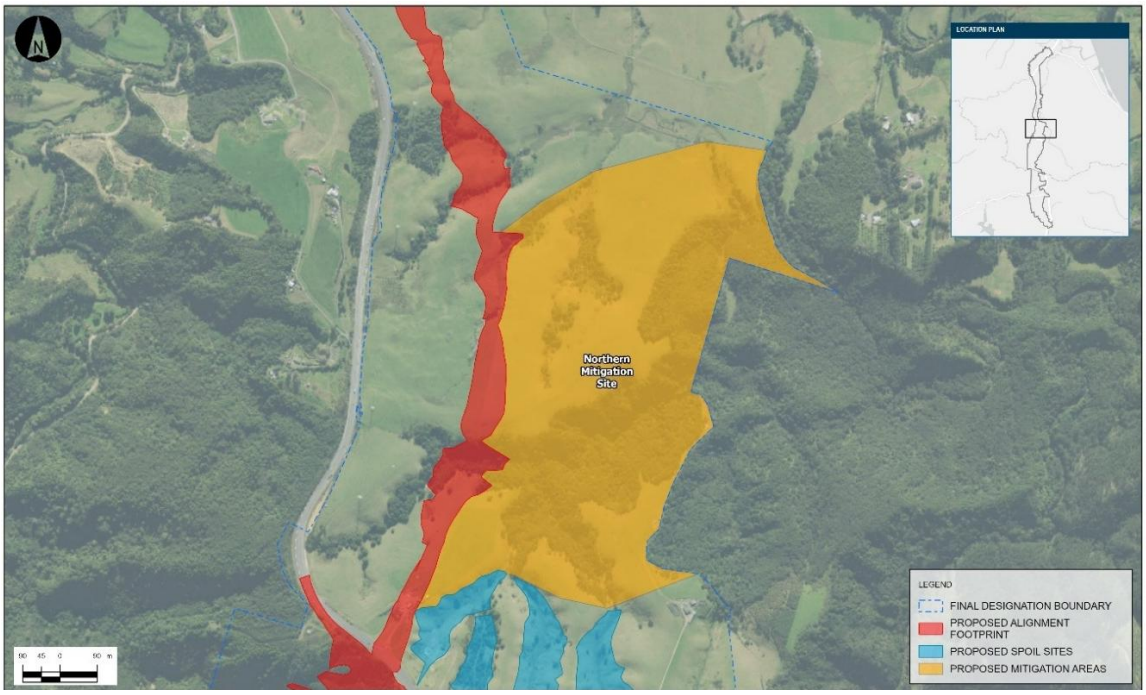

Figure 1: Indicative location of the Northern Mitigation Site

5.1.2. Central Mitigation Site

The “Central Mitigation Site” (up to approximately 114 ha) is located within the Zentral Forest property between the existing SH1 and the Indicative Alignment (Figure 2). This site is mainly comprised of existing rotational pine forestry with small, scattered pockets of Low to Very High value indigenous forest that equate to approximately 6 ha. This Site contains two sub-catchments of ephemeral, intermittent and perennial streams, which support low density populations of Hochstetter’s frog. There is approximately 16 km of Low to Moderate quality stream habitat that is suitable for enhancement and/or frog release site (**Appendix Q**). It also supports snail species due to the presence of suitable refugia and likely also supports some indigenous lizard species.

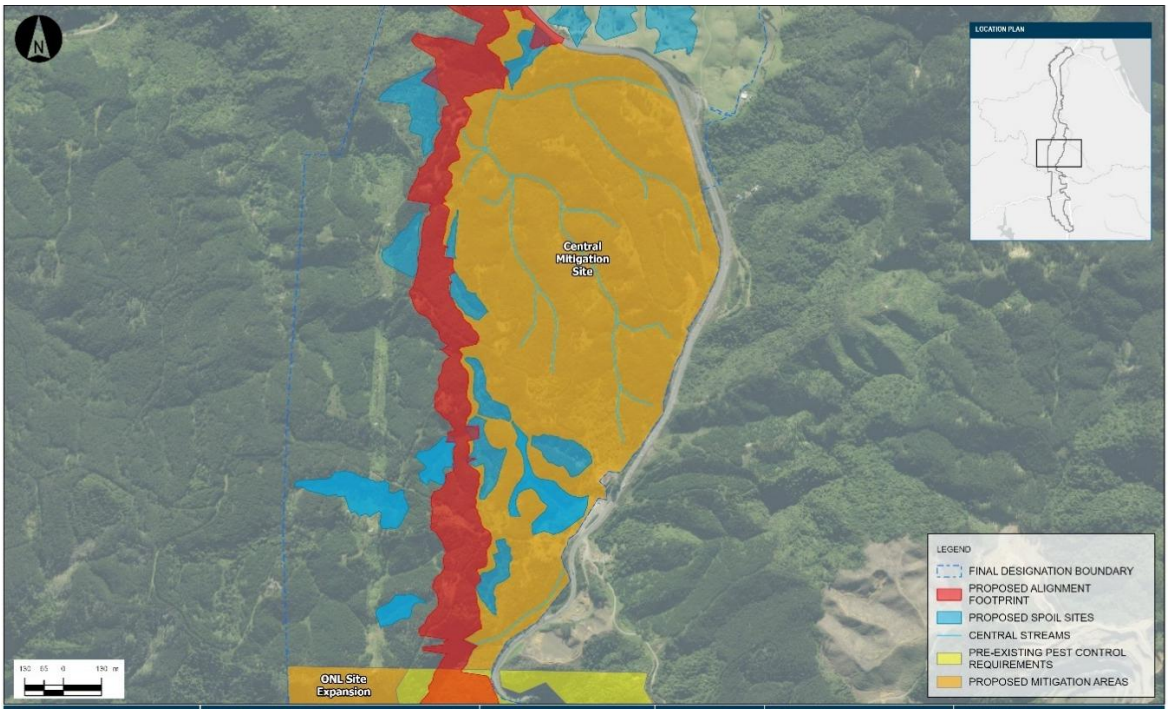

Figure 2: Indicative location of the Central Mitigation Site

5.1.3. Southern Mitigation Site:

The “Southern Mitigation Site” (approximately 29 ha) is characterised by a large remnant tract of kauri-podocarp-broadleaf forest that is protected under a Queen Elizabeth II National Trust covenant and scattered indigenous dominated remnants surrounding the covenanted area (Figure 3). The Site provides a potential area to support mitigation planting and linking up fragmented forest remnants and supports lizards, bats and invertebrates but no Hochstetter’s frog were confirmed on site. The site is possibly unsuitable for frog relocations due to the underlying geology influencing pH levels within streams. This site contains approximately 19.4 ha of existing indigenous vegetation, providing the opportunity to convert a further 9.7 ha from pasture.

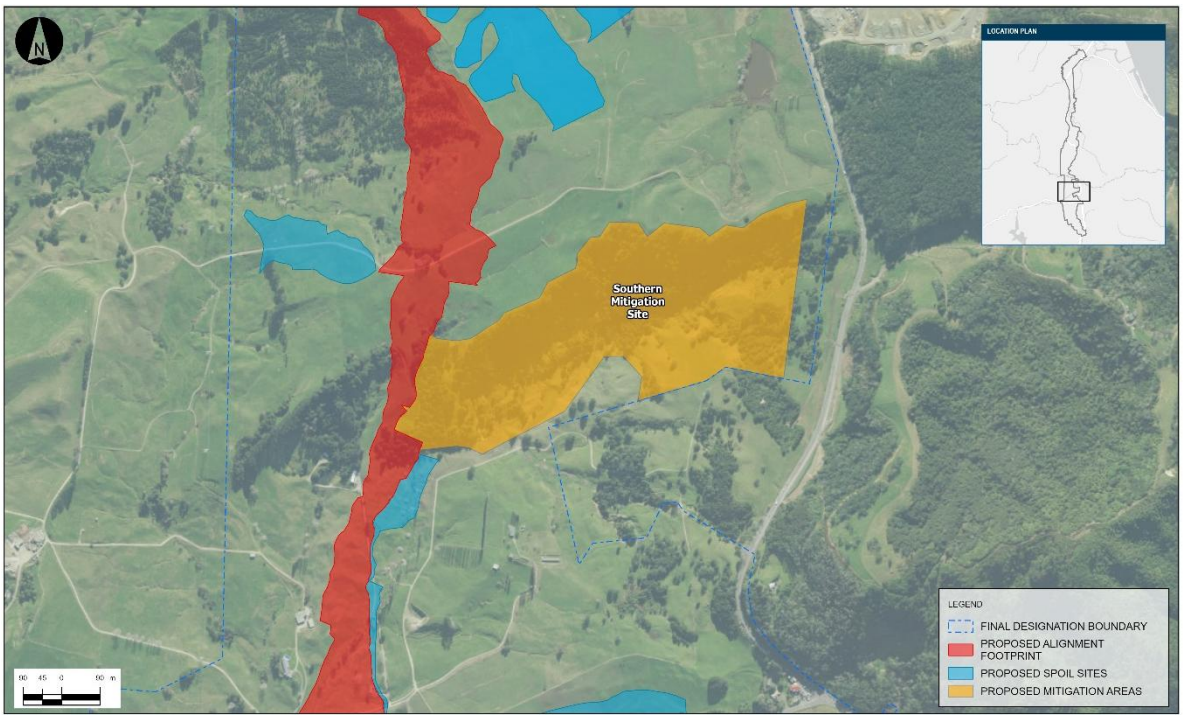

Figure 3: Indicative location of the Southern Mitigation Site

5.1.4. Mitigation actions at the Mitigation Sites

Some or all of the following may be required depending on the mitigation site:

Northern and Southern Mitigation Sites:

- Exclude stock from the site, to incorporate non-forested areas for mitigation planting.
- Mitigation planting of eco-sourced native plants, which should include:
  - infill or remediation planting (e.g. pasture or degraded wetlands/riparian zones).
  - specific edge habitat enhancement or creation for copper skink.
  - areas of low-growing dense vegetation.
  - native tree species likely to provide roosting habitat for bats in the long term.
  - Offset planting for kauri tree loss within the mitigation planting areas.
- Maintenance of the mitigation planting until it exceeds 80% indigenous vegetation cover.
- Protection of the areas through covenants and/or encumbrances (or similar legal mechanisms) to ensure the indigenous vegetation cannot be removed.
- Weed control within the entire area of the Mitigation Sites for five years or until the planted areas exceed 80% canopy cover within planted areas (whichever takes longer).
- Habitat enhancement for specific fauna (e.g. wood piles for lizards).

- Pest control for five years.

Central Mitigation Site:

- Actions proposed for the Northern and Southern Mitigation Sites will also be appropriate for the Central Site should indigenous revegetation be required.
- This site will require a slower transition to indigenous forest regeneration to allow for the current forestry rotation to be completed.
- A minimum 10 m setback from all Hochstetter's frog habitat within the sub catchment.
  - The extended setback should apply to all habitat, including ephemeral, intermittent and headwater streams, not only the perennial covered by the NES-CF.
- Infill or remediation planting where needed along riparian corridors.
- Protection to ensure the indigenous vegetation cannot be removed.
- Habitat enhancement for frogs (e.g. relocation of cover objects from salvage sites).
- Mammalian Pest Control for five years.

5.1.5. Vegetation

Standard NZTA monitoring for the first five years post Project construction will be incorporated into the planting maintenance programme.

5.1.6. Species-Specific Monitoring

Where appropriate, species specific monitoring may be recommended as part of the WAA applications being sought for native lizards, frogs and snails. If required, these recommendations will be detailed in the Ecological Management Plan (EMP).

6. Post-mitigation Assessment of Effects

If the recommended mitigation outlined in Section 5 is completed, we consider the post mitigation (residual) effects on habitat values, individual species or species assemblages will range from Low – High. The post mitigation effects, for all effects with a pre-mitigated level of effect of 'Moderate' or higher (Table 23) are detailed in Table 24 to Table 28 below.

We consider post mitigation effects that we have assessed as being 'Moderate' or higher warrant further measures to offset or compensate for these effects.[12]

[12] Page 84, Roper-Lindsay et al., (2018) EcIA guidelines.

Table 24: Unmitigated and mitigated level of effects on vegetation. Effects in bold warrant further measures to offset or compensate for these effects.

Potential Effects on vegetation	Ecological component	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect	Mitigation	Mitigated magnitude of effect	Mitigated overall level of effect
Permanent Effects							
Vegetation community loss	Vegetation types	Very High	High – Direct loss of 18 ha	Very High	▪ Minimisation through detailed design and construction methodology. ▪ Mitigation planting of pasture at the Northern and Southern Mitigation Sites totalling up to 39.5 ha. ▪ Replacement of rotational pine forestry with mitigation planting totalling up to 103.6 ha ▪ Enhancement of Low to Moderate value Existing Vegetation at all three Mitigation Sites totalling 15.6 ha.	Moderate	High
		High	High – Direct loss of 7 ha	High		Moderate	High
		Moderate	Moderate – Direct loss of 4 ha	Moderate		Low	Low
Threatened plant species specimen loss	Kauri	High	High – Loss of three large kauri and several mature kauri groves.	Very High	▪ Minimisation through detailed design and construction methodology. ▪ Offset planting at a ratio of 50:1 for trees larger than 50 cm DBH.	Moderate	Moderate
Indirect loss or damage via kauri dieback introduction	Kauri	High	High – Spread to new sites	High	▪ Correct application of the Kauri Hygiene Standard Operating Procedures.	Negligible	Low
Habitat fragmentation and edge effects	Vegetation types	Very High	High	Very High	▪ Reduce fragmentation and edge effects at the North and South Mitigation Sites through infill and remediation planting.	Moderate	High
		High	High	Very High		Moderate	High

Table 25: Unmitigated and mitigated level of effects on native lizards confirmed on site (copper skink). Effects in bold warrant further measures to offset or compensate for these effects

Potential Effects on native lizards	Species	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect	Mitigation	Mitigated magnitude of effect	Mitigated overall level of effect
Permanent Effects							
Habitat loss	Copper skink	High	Moderate	High	▪ Minimisation through detailed design and construction methodology ▪ Mitigation planting and enhancement of existing native vegetation at the three Mitigation Sites	Low	Low
Habitat fragmentation	Copper skink	High	Moderate	High	▪ Reduce fragmentation and edge effects at North and South Mitigation Sites through stock exclusion, pest control and infill and remediation planting. ▪ Creation of habitat at the Central Mitigation site, providing higher quality connectivity between other habitat within the landscape.	Low	Low
Temporary - Construction Phase / Short to Medium term							
Injury or death during habitat removal and displacement.	At Risk – Declining species	High	Moderate	High	▪ Salvage and relocation within appropriate seasonal constraints.	Low	Low
	Not Threatened species	Moderate	Moderate	Moderate		Low	Low

Table 26: Unmitigated and mitigated level of effects on Hochstetter's frogs. Effects in bold warrant further measures to offset or compensate for these effects

Potential Effects on frogs	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect	Mitigation	Mitigated magnitude of effect	Mitigated overall level of effect
Permanent Effects						
Habitat loss	High	High	Very High	▪ Minimisation through detailed design and construction methodology. ▪ Mitigation enhancement and protection of existing riparian native vegetation at the Northern and Central Mitigation Site totalling 14.2 km (direct habitat loss).	Moderate	High
Habitat fragmentation	High	High	Very High	▪ Reduce fragmentation and edge effects at the North and Central mitigation Site through habitat enhancement totalling 11.7 km additional riparian enhancement.	Moderate	High
Indirect habitat loss and degradation via habitat fragmentation and edge effects	High	Moderate	High	▪ Minimisation though habitat enhancement and buffer planting. ▪ Minimisation by ensuring spoil site and culvert design does not result in significant hydrological changes downstream of works impacting frog habitat. ▪ Mitigation via stormwater and run off management such as incorporating swales and detention ponds in the design. ▪ Mitigation by using increased culvert diameters to allow for upstream frog movements in low flow conditions.	Low	Low
Operational disturbance	High	Low	Low	▪ Staging works effectively to reduce ongoing operation disturbance to frogs. ▪ Ensuring frog hygiene protocols are strictly followed.	Low	Low
Temporary - Construction Phase / Short to Medium term						

Potential Effects on frogs	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect	Mitigation	Mitigated magnitude of effect	Mitigated overall level of effect
Injury or death during construction, displacement with increased predation and resource pressure	High	High	Very High	▪ Salvage and relocation within appropriate seasonal constraints and under strict frog hygiene protocols.	Low	Low
Indirect construction disturbance (sedimentation, noise, lighting, vibration)	High	High	High	▪ Best practice sediment and erosion control measures are implemented. ▪ Continuous water quality monitoring near streams with confirmed frog presence. ▪ Implementing concrete pouring and flushing protocols near and within waterways to prevent the PH level spiking in streams. ▪ Under WAA, undertaking the salvage of frogs prior to blasting or heavy vibration in nearby impacted streams where frogs may be adversely impacted by the work. ▪ Reducing construction lighting at nighttime in proximity to streams with confirmed frog presence	Low	Low

Table 27: Unmitigated and mitigated level of effects on bats. Effects in bold warrant further measures to offset or compensate for these effects

Potential Effects on bats	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect	Mitigation	Mitigated magnitude of effect	Mitigated overall level of effect
Permanent Effects						
Habitat loss	Very High	Low	Moderate	▪ Minimisation through detailed design and construction methodology ▪ Mitigation planting and enhancement of existing native vegetation at the three Mitigation and Release Sites allowed for under vegetation and frog mitigation	Negligible	Low
Habitat fragmentation	Very High	Moderate	High	▪ Reduce fragmentation and edge effects at the North and South Mitigation Sites through infill and remediation planting ▪ Vegetation and foraging habitat allowed for under vegetation and frog mitigation ▪ Retain/install bat hop-overs	Negligible	Low
Mortality by vehicle collision	Very High	Low	Moderate	▪ Retain/install bat hop-overs	Negligible	Low
Operational disturbance (noise and lighting)	Very High	Moderate	High	▪ Restrictions on lighting in proximity to bat roost habitat	Negligible	Low
Temporary - Construction Phase / Short to Medium term						
Injury or death during vegetation removal	Very High	High	Very High	▪ Implementation of DOC's BRP	Negligible	Low
Indirect construction disturbance (noise, lighting, and vibration)	Very High	Low	Moderate	▪ Where active roosts are identified, protocols should be implemented until the roost is no longer occupied to reduce the risk of disturbance of roosts and be detailed within the vegetation removal protocols prepared for the Project. These should include (but not be limited to): A 50 m setback area for construction activities around the active roost/s until monitoring can determine that the roost/s are no longer occupied, and prohibiting or limiting construction activities within 50 m from an active roost/s two hours before sunset until one hour after sunrise.	Negligible	Low

Table 28: Unmitigated and mitigated level of effects on invertebrates.

Potential Effects on invertebrates	Species	Ecological Value	Unmitigated magnitude of effect	Unmitigated level of effect	Mitigation	Mitigated magnitude of effect	Mitigated overall level of effect
Permanent Effects							
Habitat loss	At Risk – Declining species (Kauri snail and *A. dunniaie*)	High	Moderate	High	▪ Minimisation through detailed design and construction methodology ▪ Mitigation planting and enhancement of existing native vegetation at the North and South Mitigation Sites (totalling 56 ha)	Low	Low
Indirect habitat loss and degradation via habitat fragmentation and edge effects	At Risk – Declining species	High	Moderate	High	▪ Reduce fragmentation and edge effects at the North and South Mitigation Sites through stock exclusion, pest control and infill and remediation planting	Low	Low
Temporary - Construction Phase / Short to Medium term							
Injury or death during habitat removal and displacement	At Risk – Declining species	High	Moderate	High	▪ Salvage and relocation within appropriate seasonal constraints	Low	Low

7. Conclusion

This Ecological Impact Assessment has identified a range of potential adverse effects on terrestrial ecological values addressed herein. The mitigation we have recommended will be adequate to address effects on long-tailed bats. Similarly, we anticipate that the ecological mitigation we have recommended to meet Wildlife Act approval requirements will adequately address impacts on native lizards and kauri snails. While not protected under the Wildlife Act, we recommend that the At Risk Rhytid snail *Amborhytida dunniae* is managed alongside kauri snail as part of the ecological management implemented for the Wildlife Approval. On that basis, provided our recommendations are implemented, we conclude that the Project will have no moderate or higher residual adverse effects on native bats, lizards and terrestrial invertebrates.

We have assessed effects on high and very high value native vegetation (including kauri) and Hochstetter's frogs as moderate or greater, even after mitigation. While Project's residual adverse effects on those values will remain if unmanaged, those residual effects may be acceptable considering the purpose and relevant decision-making provisions of the FTAA in the context of the enabling benefits of the Project.

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APPENDICES

Appendix A
Lizard Survey Locations

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	10/12/2025	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:100,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

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DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION LIZARD ARTIFICIAL COVER OBJECTS (ACO) OVERVIEW MAP

PROJECT INFORMATION			
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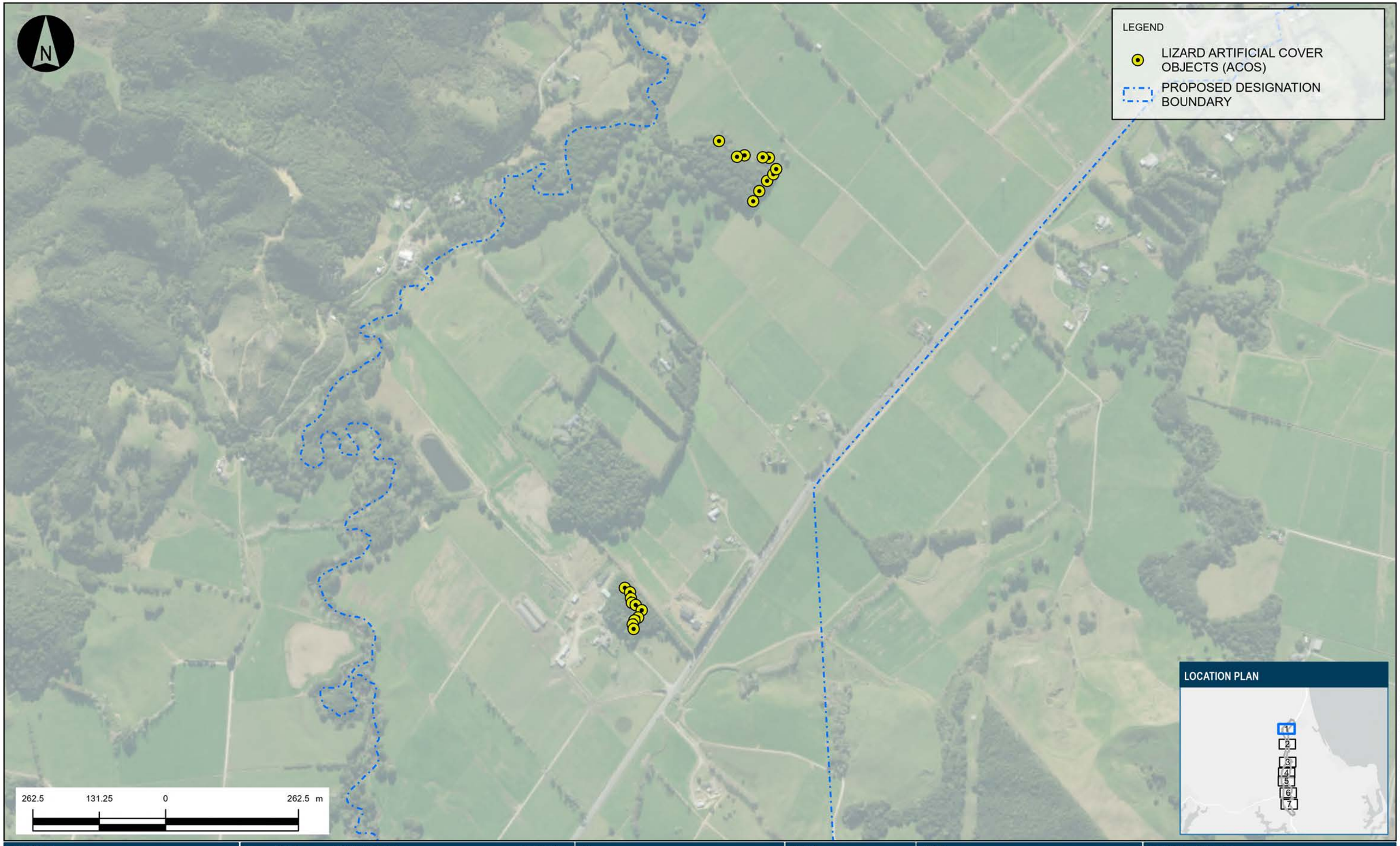

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CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
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APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
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PROJECT INFORMATION

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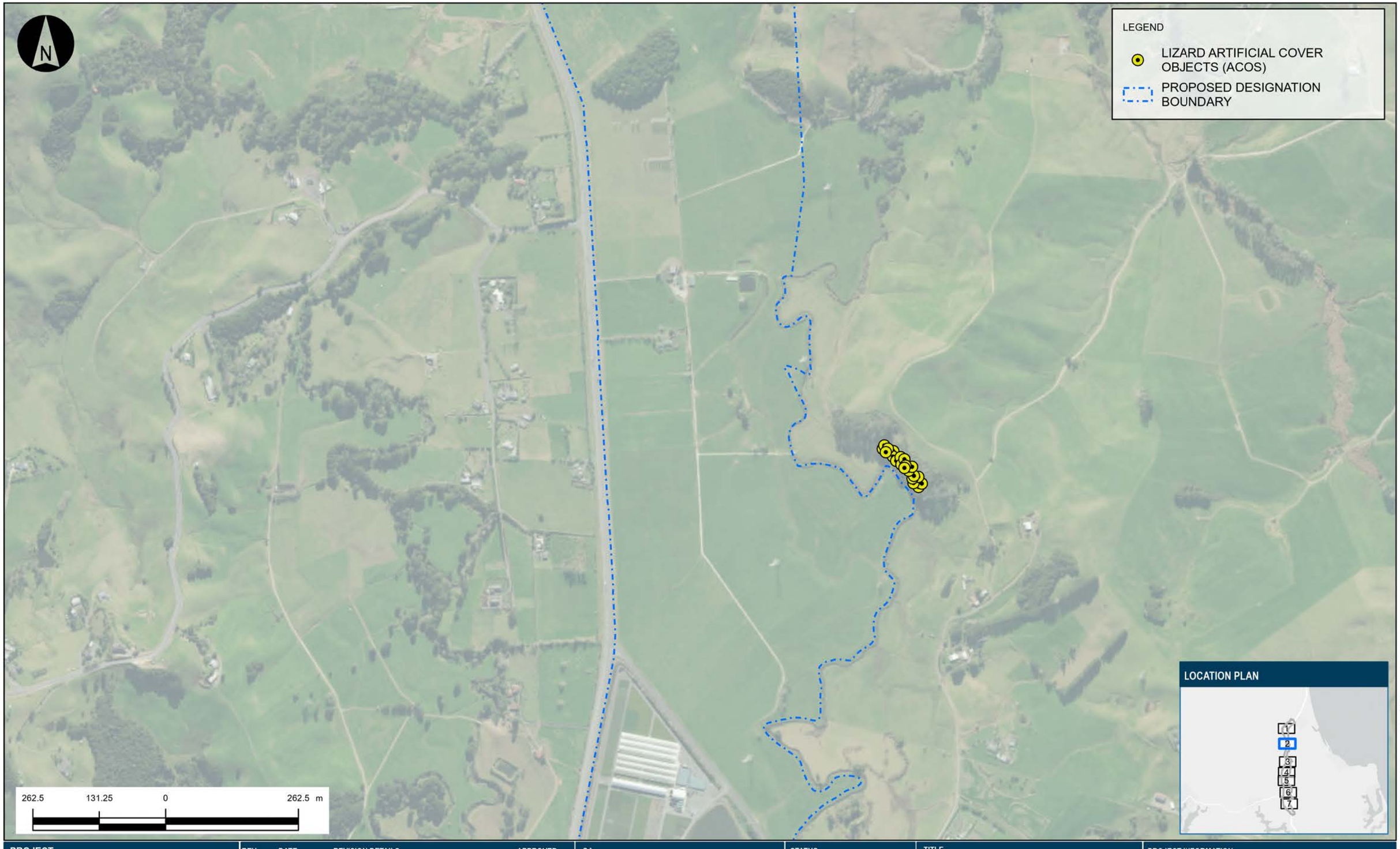

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VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
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APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
LIZARD ARTIFICIAL COVER OBJECTS (ACO) SHEET 2 OF 7

PROJECT INFORMATION

NORTHLAND CORRIDOR

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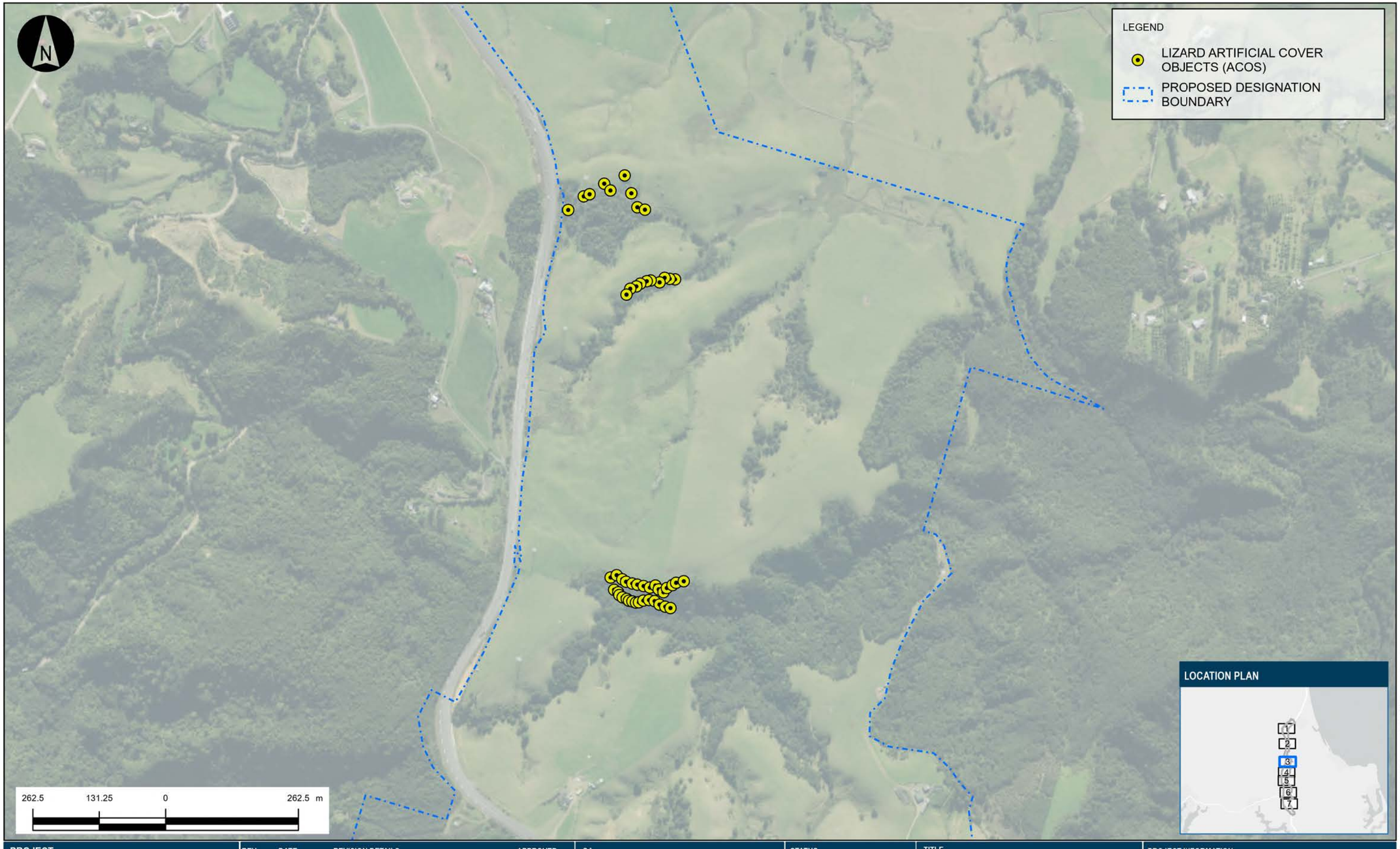

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REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
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APPROVED	
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APPROVED BY	DATE
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BRYNDERWYN HILLS SECTION
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PROJECT INFORMATION

NORTHLAND CORRIDOR

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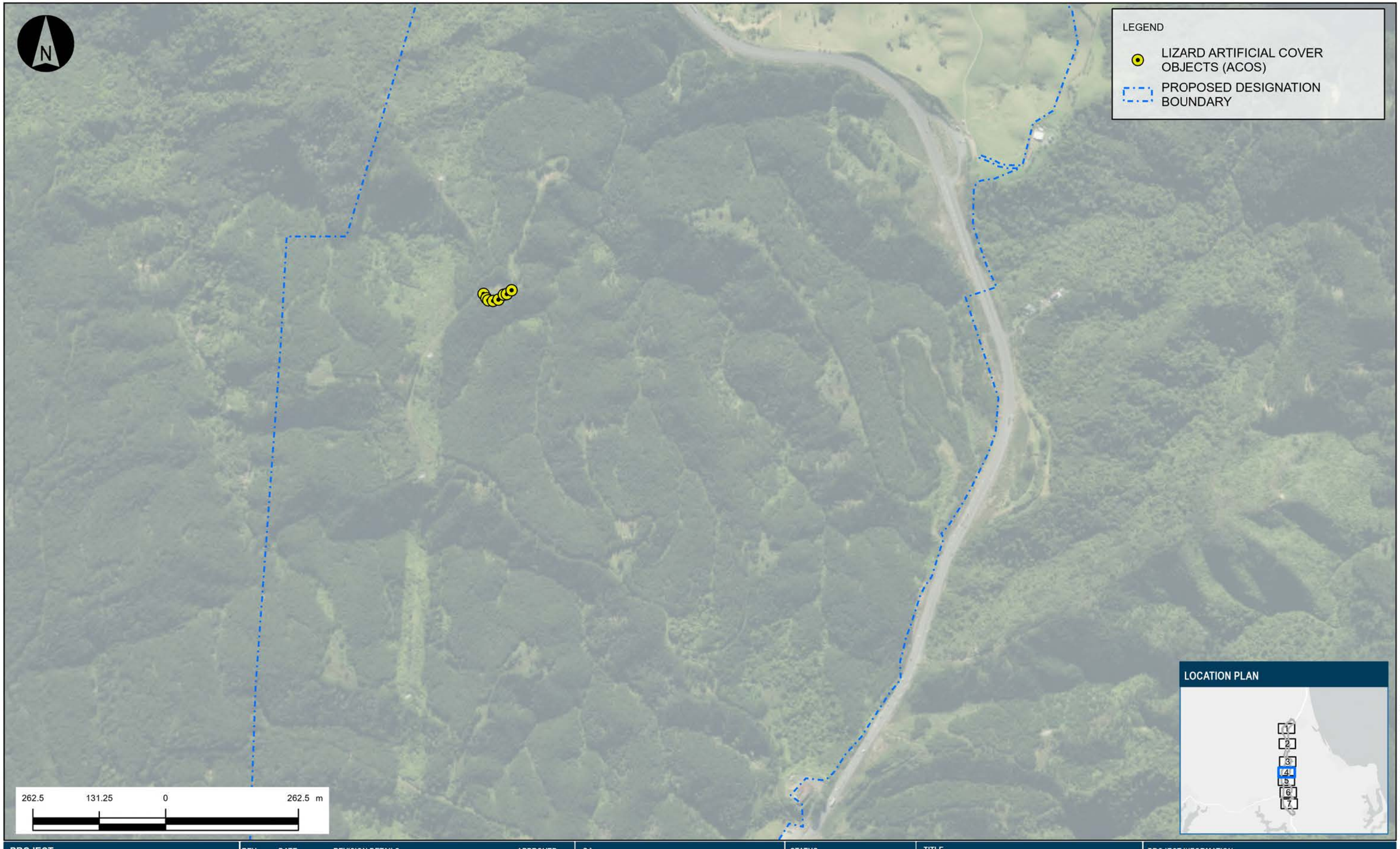

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STATUS	
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R. DU PLOOY	31/03/2026

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BRYNDERWYN HILLS SECTION
LIZARD ARTIFICIAL COVER OBJECTS (ACO) SHEET 4 OF 7

PROJECT INFORMATION

NORTHLAND CORRIDOR

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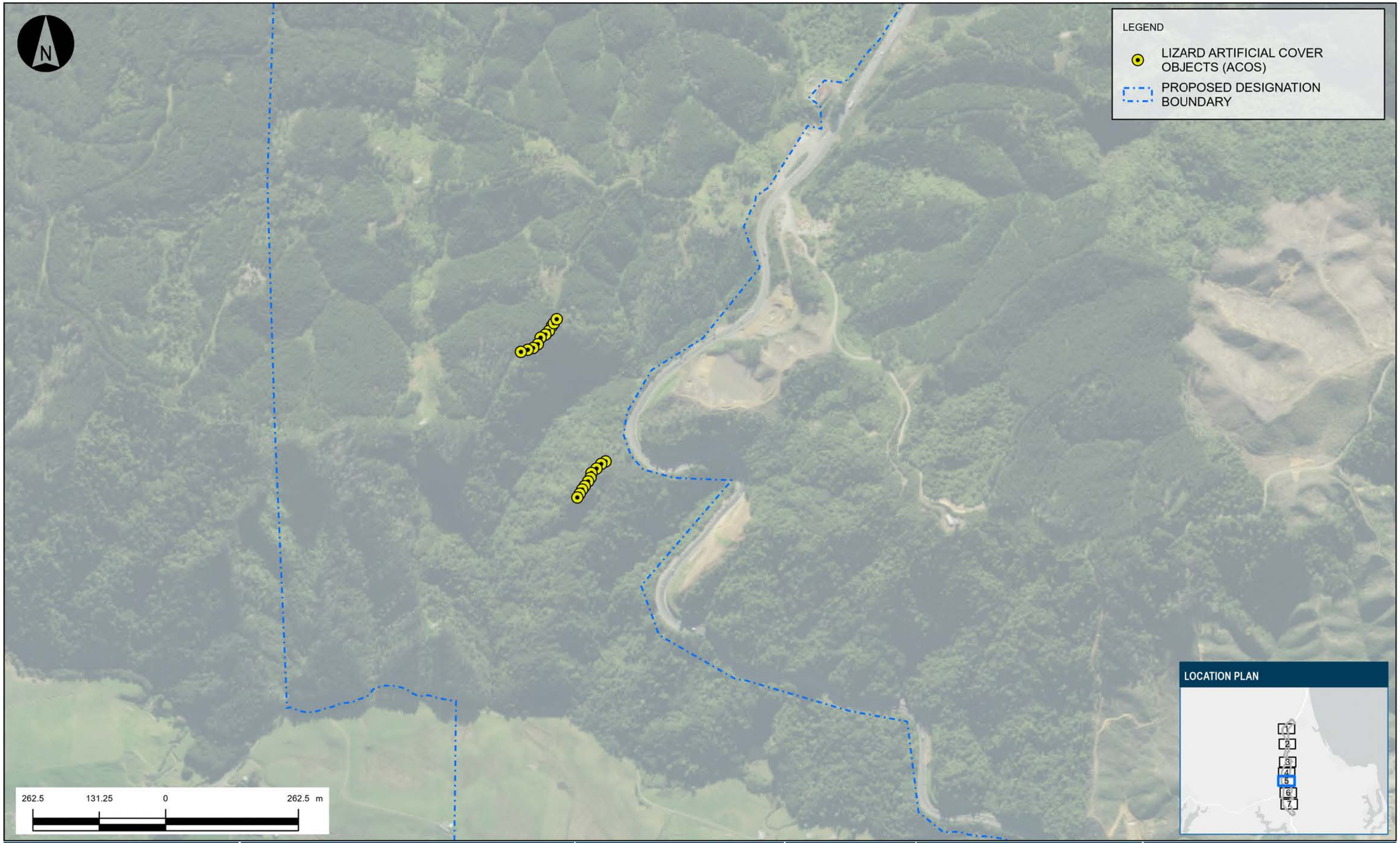

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VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

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R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

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BRYNDERWYN HILLS SECTION
LIZARD ARTIFICIAL COVER OBJECTS (ACO) SHEET 5 OF 7

PROJECT INFORMATION

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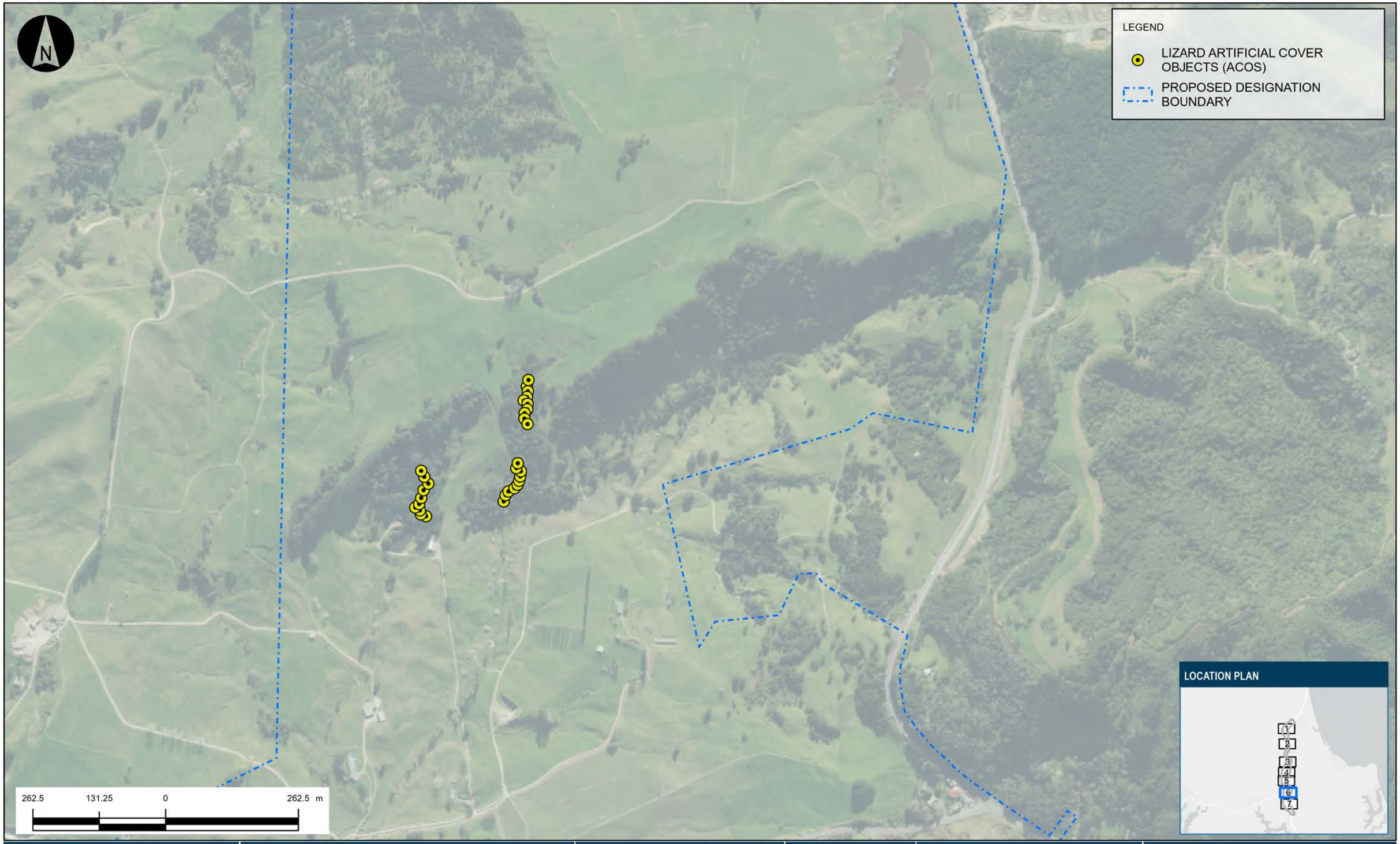

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R. DU PLOOY	31/03/2026

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BRYNDERWYN HILLS SECTION LIZARD ARTIFICIAL COVER OBJECTS (ACO) SHEET 6 OF 7

PROJECT INFORMATION

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PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	22/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED: R. DU PLOOY

APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION LIZARD ARTIFICIAL COVER OBJECTS (ACO) SHEET 7 OF 7

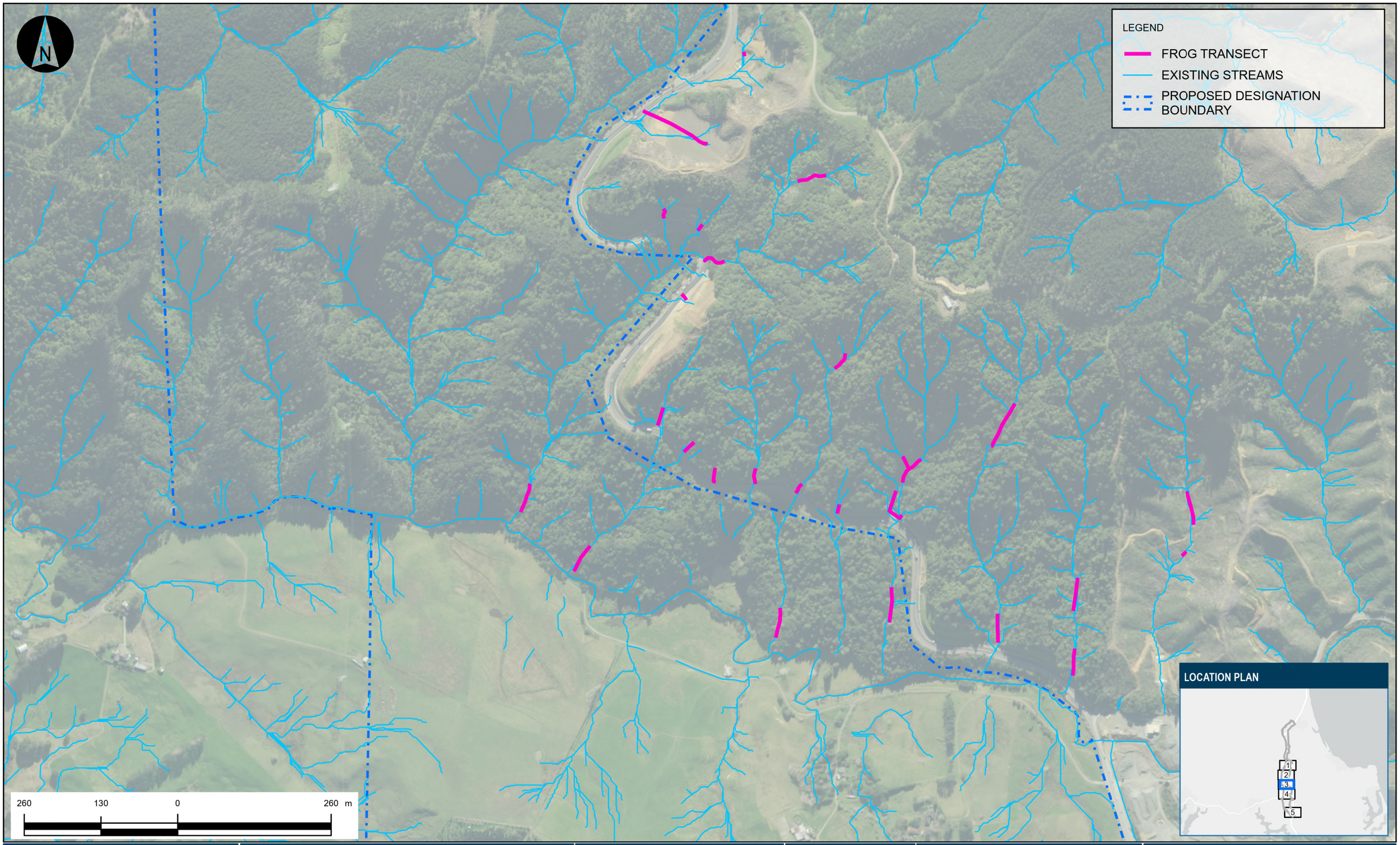
PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: **10722-PTA-2B0-PE-DRG-1229**

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1229	C

Appendix B
Frog Survey Locations



PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:6,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	19/12/2025	FOR INFORMATION	RDP
B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	M. MADSEN	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS
FOR INFORMATION
APPROVED
R. DU PLOOY
APPROVED BY / DATE
R. DU PLOOY — 31/03/2026

TITLE
BRYNDERWYN HILLS SECTION LOCATION OF BASELINE FROG TRANSECT SURVEYS
UNDERTAKEN BY WSP FOR THE BRYNDERWYN HILLS RESILIENCE RECOVERY PROJECT IN NOVEMBER AND DECEMBER 2023

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1161			
SCALE	SIZE	REFERENCE NO.	REV
1:6,000	A3	PE-1161	C

Appendix C
Snail Survey Effort

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	27/03/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:89,985 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	27/03/2026
CHECKED	H. SANTOS	27/03/2026
REVIEWED	L. DENMEAD	27/03/2026
VERIFIED	H. SANTOS	27/03/2026
PROJECT LEAD	J. HIND	27/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	27/03/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
OVERVIEW MAP

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1196			
SCALE	SIZE	REFERENCE NO.	REV
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PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	L. DENMEAD	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
SHEET 1 OF 8

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1214			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1214	C

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	L. DENMEAD	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
SHEET 2 OF 8

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1215			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1215	C

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	L. DENMEAD	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
SHEET 3 OF 8

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1216

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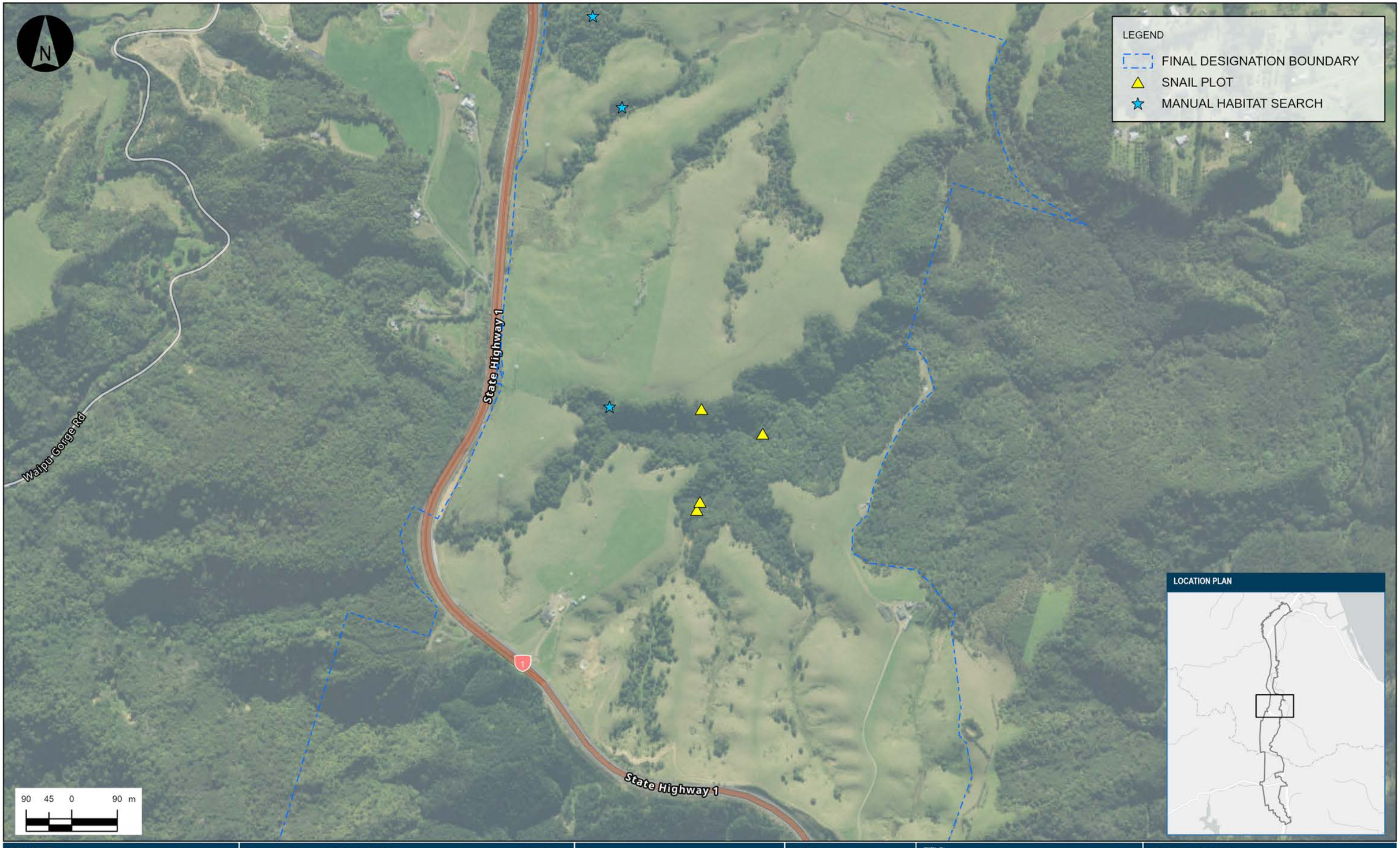

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	L. DENMEAD	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
SHEET 4 OF 8

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1217			
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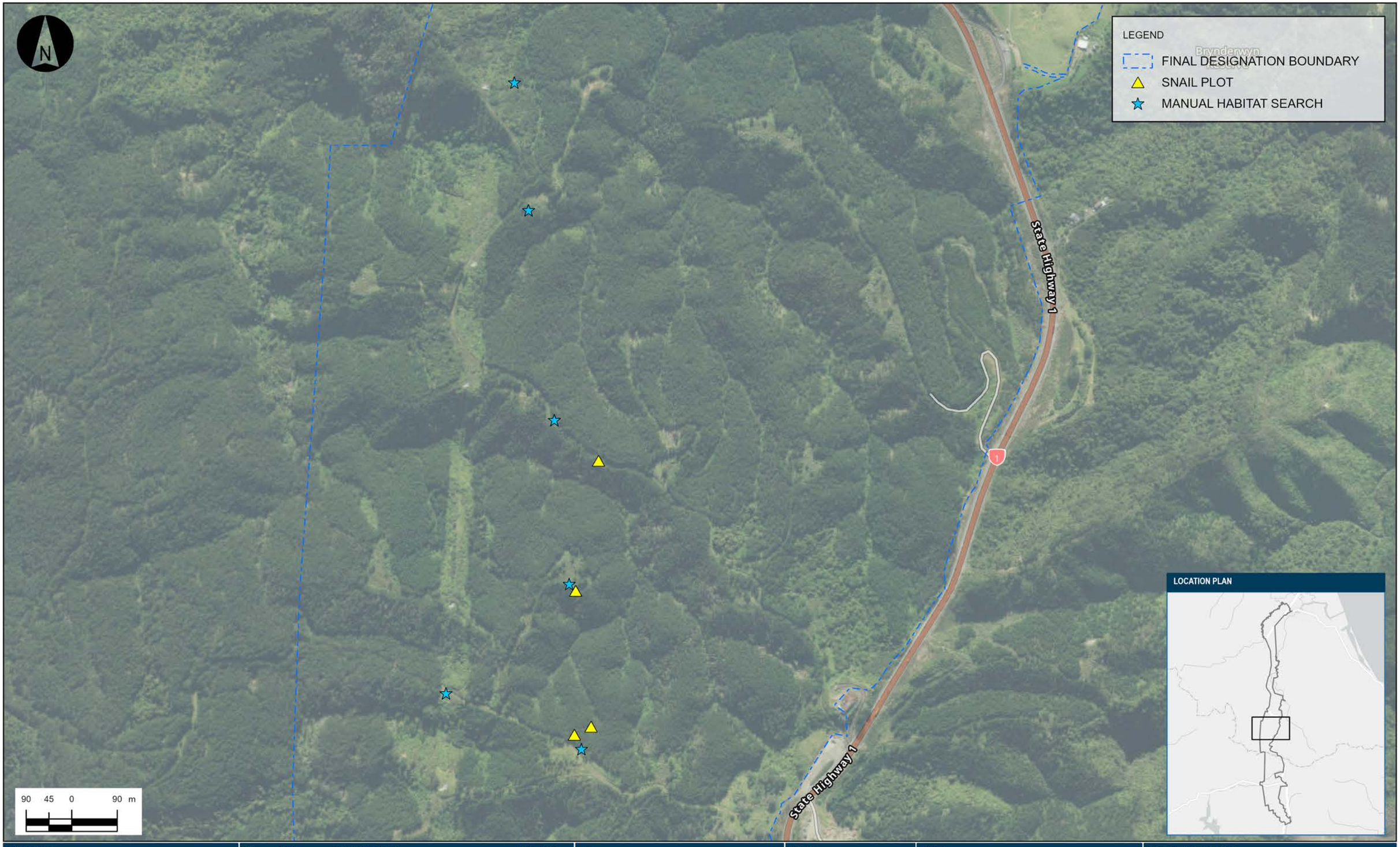

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	L. DENMEAD	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
SHEET 5 OF 8

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1218

SCALE	SIZE	REFERENCE NO.	REV
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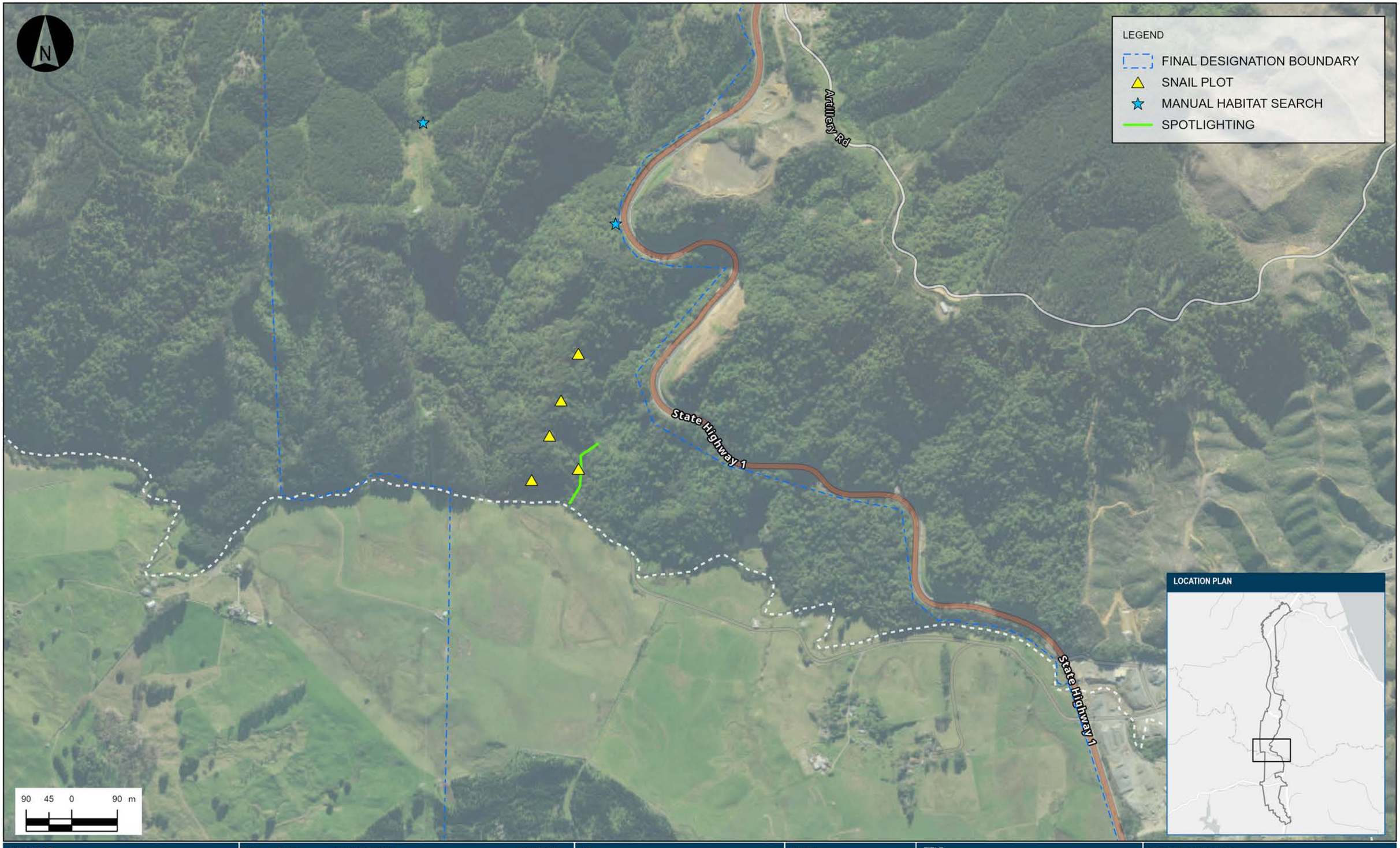

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	L. DENMEAD	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
SHEET 6 OF 8

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1219

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1219	C

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	L. DENMEAD	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
SHEET 7 OF 8

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1220

SCALE	SIZE	REFERENCE NO.	REV
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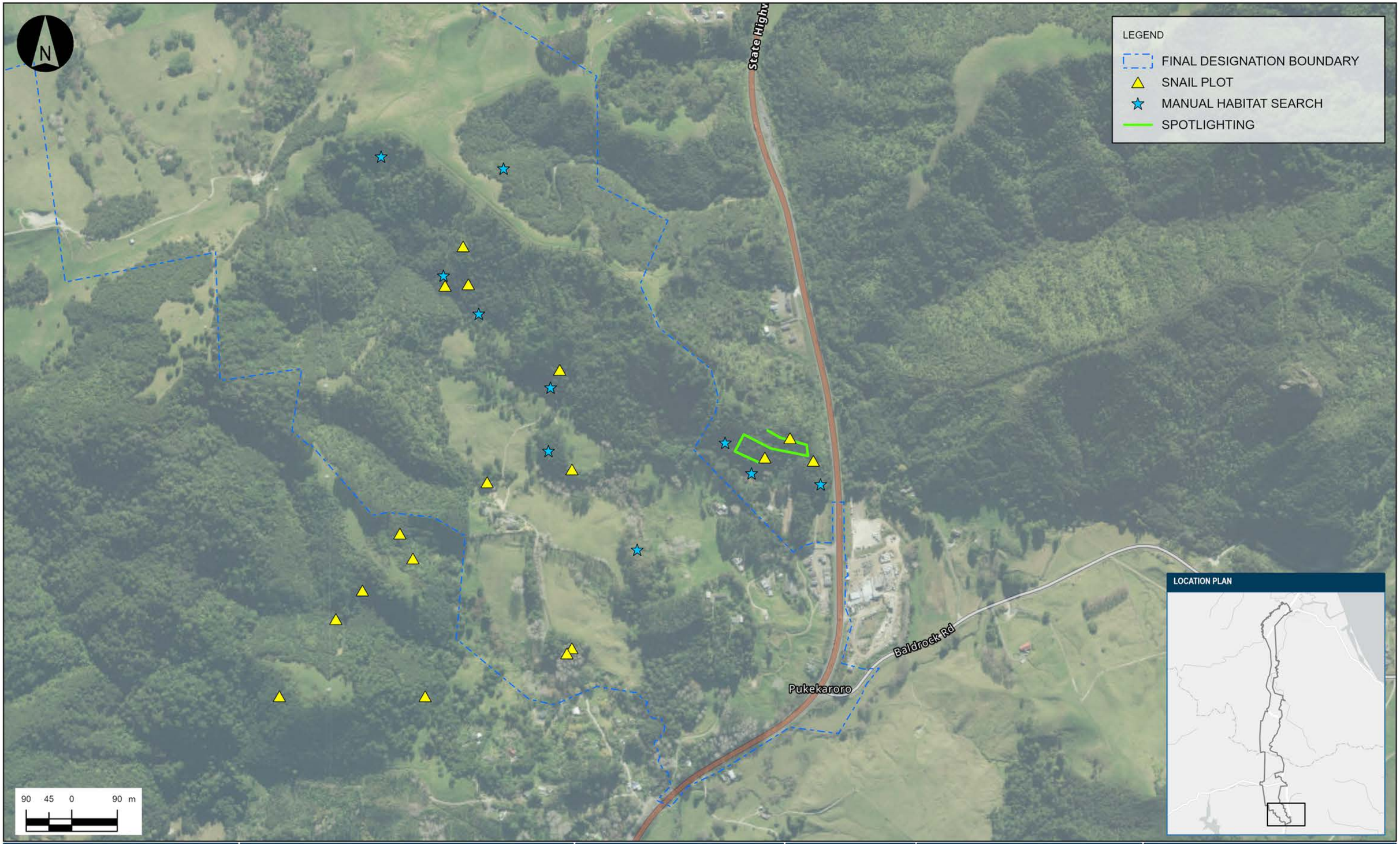


PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	L. DENMEAD	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
SNAIL SEARCH EFFORT
SHEET 8 OF 8

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1221

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1221	C

Appendix D
Vegetation Classifications and Descriptions

Anthropic tōtara forest

Description: Anthropic tōtara forest was a common vegetation type observed along the Proposed Designation. It is characterised by semi-mature to mature tōtara (*Podocarpus totara*) dominating the canopy, with kānuka (*Kunzea robusta*) commonly occurring, and occasional kahikatea (*Dacrycarpus dacrydioides*). Canopy cover is typically discontinuous and the subcanopy is sparse with occasional regenerating tōtara, or entirely absent. Occasional podocarps and broadleaf species such as rimu (*Dacrydium cupressinum*), pūriri (*Vitex lucens*), tānekaha (*Phyllocladus trichomanoides*) occur within the canopy and subcanopy. The understory is also typically sparse due to cattle grazing and consists of species unpalatable to stock such as twiggy coprosma (*Coprosma rhamnoides*), gorse (*Ulex europaeus*), barberry (*Berberis glaucocarpa*), blackberry (*Rubus fruticosus* agg.), Mexican devil (*Ageratina adenophora*), and occasional groves of silver fern (*Alsophila dealbata*). Occasional regenerating native species occur in the understory and include karamu (*Coprosma robusta*) and red matipo (*Myrsine australis*). The ground cover at many of these sites is pugged and dominated by rank kikuyu (*Cenchrus clandestinus*) grassland and other common grass species such as annual poa (*Poa annua*), ryegrass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*), and Yorkshire fog (*Holcus lanatus*). Exotic pasture species such as foxglove (*Digitalis purpurea*), white clover (*Trifolium repens*), narrow-leaved plantain (*Plantago lanceolata*), buttercup (*Ranunculus repens*), ragwort (*Jacobaea vulgaris*), scotch thistle (*Cirsium vulgare*), self-heal (*Prunella vulgaris*), and lotus (*Lotus pedunculatus*) are frequently interspersed throughout the rank grassland. In particularly wet and riparian areas, Japanese lady fern (*Deparia petersenii* subsp. *congrua*) and tradescantia (*Tradescantia fluminensis*) are common with occasional occurrences of *Carex* spp. Frequent fern species observed in the understory include rasp fern (*Doodia australis*) and rosy maidenhair (*Adiantum hispidulum*). The epiphytic leather-leaf fern (*Pyrrosia eleagnifolia*) is commonly observed on large trees.

Bamboo forest

Description: Bamboo forest is characterised by mature thickets of bamboo (*Phyllostachys* spp.) which form a monotypic canopy with an absence of other vegetation structural tiers. There are occasional occurrence of regenerating exotic and native species in the understory, including kawakawa (*Piper excelsum* subsp. *excelsum*), nikau (*Rhopalostylis sapida*), and shaking brake (*Pteris tremula*).

Broadleaved species scrub forest

Description: Broadleaved scrub forests are characterised by a low stature canopy (<10m) of several commonly occurring broadleaf species including kānuka, nikau, puriri, large-leaved māhoe (Melicytus macrophyllus), māhoe (Melicytus ramiflorus subsp. ramiflorus), seven finger (Schefflera digitata), karaka (Corynocarpus laevigatus), mamaku (Sphaeropteris medullaris), as well as occasional totara, silver fern, kanuka and pigeonwood (Hedycarya arborea). Some of these remnants had occasional emergent kahikatea, rewarewa (Knightia excelsa), and tanekaha (Phyllocladus trichomanoides). Most remnants had no subcanopy, but mamaku occasionally occur in this tier. The understory and groundcover were typically sparse and open due to incomplete fencing and stock access; however, where access was limited by steep terrain, a mostly indigenous composition was observed. Where vegetated, the understory commonly consisted of juveniles of reported canopy species. Additionally, the understory commonly consisted of hangehange, twiggy coprosma, red matipo and kawakawa (Piper excelsum). Other occasional understory species included totara, seven finger, kanono (Coprosma grandifolia), thin-leaved coprosma (Coprosma areolata), tree coprosma (Coprosma arborea), shining karamu (Coprosma lucida), karamu (Coprosma robusta), gully fern (Pakau pennigera), water fern (Histiopteris incisa), toatoa (Haloragis erecta subsp. erecta), tree fuchsia (Fuchsia excorticata), shining spleenwort (Asplenium oblongifolium) and locally abundant arum lily (Zantedeschia aethiopica). Where grazing pressure was highest, the groundcover was predominantly rank grass, but areas with less grazing consisted of basket grass (Oplismenus hirtellus subsp. imbecillis) which dominated, commonly occurring Japanese lady fern rough maidenhair fern

(Adiantum hispidulum), shaking brake (Pteris tremula), thread fern (Icarus filiformis), smooth shield fern (Parapolystichum glabellum), crown fern (Lomaria discolor) and kiokio (Parablechnum novae-zelandiae). Occasional orchid species include onion-leaved orchid (Microtis unifolia) and pixie cap (Acianthus sinclairii). Riparian areas had locally abundant/common patches of kawakawa and parataniwha (Elatostema rugosum). Common epiphytes/lianas include shining spleenwort, drooping spleenwort (Asplenium flaccidum), fork fern (Tmesipteris lanceolata), and bush lawyer (Rubus cissoides).

Crack willow/mixed exotic and native shrub/exotic groundcover

Description: This vegetation was observed in riparian locations throughout the Proposed Designation and consisted of a canopy dominated by crack willow (*Salix fragilis* x *S. euxina*). Occasional canopy species include totara, Poplar (*Populus* spp.), Maple (*Acer* spp.), Eucalyptus (*Eucalyptus* spp), and *Prunus* spp. Frequent subcanopy species include nikau, mahoe, cabbage tree (*Cordyline australis*), and wheki (*Dicksonia squarrosa*). The understory was usually sparse, although species such as wattle (*Acacia* spp.), cabbage tree, mahoe, kawakawa, gully fern, twiggy coprosma, can occur frequently. When the abovementioned understory species are absent, exotic weeds such as wild ginger (*Hedychium* sp.) and arum lily (Zantedeschia aethiopica) form a dominant understory component in many areas. Groundcover species commonly found in these wet, riparian areas, including parataniwha (*Elatostema rugosum*), kiokio, buttercup (*Ranunculus repens*), onion weed (*Allium triquetrum*), montbretia (*Crocosmia × crocosmiiflora*), and Tradescantia (*Tradescantia fluminensis),* fool's watercress (*Helosciadium nodiflorum*) and broad-leaved dock (*Rumex obtusifolius*). Frequently occuring epiphytic species consisted of leather-leaf fern, hound's tongue fern, akatea (*Metrosideros perforata*). Occasional vines include pōhuehue (*Muehlenbeckia australis*).

Crack willow-exotic trees-remnant native trees/mixed exotic and native shrub

Description: This vegetation type consists of a modified discontinuous canopy of frequent crack willow, totara, kahikatea, kanuka and occasional occurrences of small-leaved kōwhai (*Sophora microphylla*), small-leaved milk tree (*Paratrophis microphylla*), tītoki (*Alectryon excelsus* subsp. *excelsus*) (and mataī (*Prumnopitys taxifolia*). The subcanopy is typically sparse due to its modified nature but occasionally includes species such as crack willow, kanuka and pūriri. Crack willow typically forms a dense understory. When crack willow is absent, understory species include native regenerating species dispersed from neighbouring modified vegetation types (i.e. ranked grassland), and includes arum lily, gully fern, kawakawa, red matipo, and kohekohe. Common groundcover species include Japanese lady fern, buttercup, and common ranked grassland species observed throughout the Proposed Designation.

Exotic pine forest/mixed native and exotic scrub/ranked grassland

Description: Exotic pine forest/mixed native and exotic scrub/ranked grassland was a common vegetation found within the Proposed Designation. The vegetation type is characterised by a dominance of pine in the canopy and an absent subcanopy. The understory layer is commonly absent or consists of common exotic species such as Chinese privet (*Ligustrum sinense*), tree privet (*Ligustrum lucidum*), woolly night shade, blackberry, gorse, pampas, and Mexican devil. Native scrub species such as hangehange, twiggy coprosma, kanuka, and totara occur in occasional patches. Occasional understory species include cabbage tree, karo, and tall mingimingi. Ranked grassland dominants the groundcover layer, with common exotic pasture species and other exotic species such as montbretia sporadically occurring. Hardy groundcover plants such as centella (*Centella uniflora*) are frequent in areas where the groundcover layer opens up. Species such as Japanese honeysuckle is often frequently observed climbing on low-stature shrub species.

Exotic pine forest/native broadleaf scrub

Description: Exotic pine forest/native broadleaf scrub was a common vegetation type found throughout the Proposed Designation. The canopy was dominated by pine trees (*Pinus* sp.), though occasional totara (*Podocarpus totara*) and other large broadleaf species are evident where this vegetation type flanks other native forest types. Subcanopy species are usually absent, with occasional occurrences of totara. The understory had areas locally dominated by exotic and indigenous vegetation. Locally abundant/common indigenous species included shaking brake, thin-leaved coprosma, twiggy coprosma, mahoe, pigeonwood,

kanono, mamaku, silver fern, nikau, hangehange, kanuka, kawakawa, kohekohe, large-leaved mahoe, and red matipo, and lace fern (*Paesia scaberula*). Common exotic species included woolly nightshade (*Solanum mauritianum*), blackberry, gorse, wild ginger, and Mexican devil. Occasional understory species included cabbage tree, pampas (*Cortaderia* sp.), karo (*Pittosporum crassifolium*), and tall mingimingi (*Leucopogon fasciculatus*). Pampas and gorse, occasionally form patches of dense understory layer on the edges of this vegetation type, crowding out other groundcover and understory species. Groundcover species included basket grass which ranged from frequent to common; common species such as water fern, rasp fern, lotus, foxglove, and onion weed; and occasional species such as hound's tongue (*Zealandia pustulata* subsp. *pustulata*). Common epiphytes and lianas include leather-leaf fern and Japanese honeysuckle (*Lonicera japonica*). In disturbed areas and areas adjacent to forestry tracks, ferns such as the giant hypolepis (*Hypolepis dicksonioides*) and *Hypolepis ambigua* occur occasionally.

Eucalyptus treeland/ranked grassland

Description: Eucalyptus treeland is characterised by a discontinuous canopy of Eucalyptus (*Eucalyptus* spp.), and an absent subcanopy and understory. Ranked grassland dominates the groundcover layer with frequent occurrences of exotic pasture species. The vegetation type is commonly associated with shelterbelts.

Gorse shrubland

Description: Gorse shrubland is characterised by dense thickets of gorse and is commonly observed with species such as blackberry and tradescantia. The groundcover layer is typically dominated by ranked grassland, although, exotic pastoral species are commonly observed, along with occasionally occurring native regeneration species.

Japanese cedar hedgerow

Description: Japanese cedar hedgerow is a vegetation type that consists of densely planted rows of Japanese cedar (*Cryptomeria japonica)* planted as shelterbelts across the Proposed Designation. Other exotic shelterbelt species such as she-oak (*Casuarina cunninghamiana*) occasionally occur. The vegetation type is comprised of an absent subcanopy and an understory that is commonly absent or characterised by occasionally occurring exotic species such as Chinese privet, tree privet, agapanthus (*Agapanthus praecox* subsp. *orientalis*), sod's balsam (*Impatients sodenii*), brush wattle (*Paraserianthes lophantha*), with rank grassland dominating the groundcover layer.

Kahikatea forest

Description: Two kahikatea forest remnants found near Chainage 9300 are successional indicators for the surrounding kahikatea treeland (below) remnants. Kahikatea is the monotypic canopy species alongside occasional large pūriri trees, rimu, rewarewa (*Knightia excelsa*), with singular occurrences of pukatea and matai. Common subcanopy species include karaka, pūriri, tōtara, cabbage tree, pigenwood, kohekoh, with occasionally occurring tītoki. Understory species such as swamp māhoe was abundant, with karaka, red matipo, pigeonwood, forest sedge (*Carex dissita*) being common. Occasional understory species include karamū, kohekohe, kānuka, karo, taraire (*Beilschmiedia taraire*), and gahnia (*Gahnia xanthocarpa*). Ground cover species such as basket grass (*Oplismenus hirtellus* subsp. *hirtellus*), thread fern, and hound's tongue was common, with occasional occurrences of rosy maidenhair, rasp fern and round-leaved fern (*Pellaea rotundifolia)*. Exotic weeds were often present and include commonly occurring Japanese honeysuckle (*Lonicera japonica*) and occasional species such as Chinese privet (*Ligustrum sinense*), Jerusalem cherry (*Solanum pseudocapsicum*), and English ivy (*Hedera helix*). On the margins, common ranked grassland and exotic pasture species are present. Epiphytic and lianas included Pōhuehue (*Muehlenbeckia australis*) which was frequently observed scrambling on understory plants, commonly occurring leather-leaf fern, tank lily and occasionally occurring kiekie (*Freycinetia banksii*).

Kahikatea treeland

Description: Kahikatea treeland was common throughout the Proposed Designation and commonly consisted of fragmented remnants. Mature kahikatea stands often formed a monotypic canopy, with large pūriri and karaka occasionally occurring. Isolated individuals of Pukatea (*Laurelia novae-zelandiae*)

occasionally occur amongst the stand of trees. The subcanopy is sparse to absent, with occasional cabbage trees. The understory vegetation is typically bare, although where vegetation is present, frequent species include red matipo, twiggy coprosma, and swamp māhoe (*Melicytus micranthus*). The ground cover layer is pugged, grazed, and often dominated with ranked grassland species such as kikuyu, annual poa, cocksfoot, and veldt grass (*Ehrharta erecta*). Common exotic pasture species are frequent, along with weeds such as Chinese privet, onion weed, and arum lily, Epiphytes such as tank lily (*Astelia hastata*) are common in large pūriri trees.

Kahikatea-kauri-totara treeland

Description: Kauri-kahikatea treeland was only found at V2_42 at Chainage 16300 and is a treeland remnant on the northern slopes of the Brynderwyn Hills. The canopy was dominated by kahikatea, with common tōtara and occasional occurrences of tānekaha, rimu and mature kauri trees (*Agathis australis*). The subcanopy and understory was sparse as it was unfenced to cattle. Common understory species included twiggy coprosma and was more prevalent in riparian areas alongside kiokio, hangehange, and putaputaweta (*Carpodetus serratus*). Gorse was common, in particular on the edges of the habitat where there is less canopy cover. The groundcover tier was dominated by ranked grassland, and frequent species such as Japanese lady fern, buttercup, self-heal, lotus and centella. Epiphytes such as leather-leaf fern was common, with tank lily and akatea being occasional.

Kahikatea-pukatea forest/native scrub/tradescantia

Description: Kahikatea-pukatea forest/native scrub/tradescantia was a forest remnant found at V1_144 near chainage 11100 and consisted of a canopy dominated by kahikatea with frequent pukatea. Occasional canopy species included pūriri, rimu, rewarewa, totara, and lowland ribbonwood (*Plagianthus regius* subsp. *regius*). Common subcanopy species include karaka, mahoe, with occasional occurrences of taraire, mamangi, kohekohe, and white maire (*Notelaea neolanceolata*). The understory predominantly consisted of native species such as māhoe, nikau, and karaka, silver fern, which was commonly occurring, and occasional species such as kohekohe, hangehange, twiggy coprosma, swamp mahoe, small-leaved milk tree, *Asplenium lamprophyllum*, shining spleenwort, *Diplazium australe,* Japanese spindleberry (*Euonymus japonicus*), sickle spleenwort *(Asplenium polyodon*), swamp coprosma (*Coprosma tenuicaulis*), and hydrangea (*Hydrangea macrophylla*). Tradescantia dominated the groundcover layer, with occasional occurrences of water fern and ginger. Frequent epiphytes included akatea, thread fern, tank lily, hounds tongue, supplejack (*Ripogonum scandens*), and Madeira vine (*Anredera cordifolia)*. A mature maire taiki (*Mida salicifolia*) individual and saplings were also observed within this vegetation type.

Kānuka forest

Description: Kānuka forest was a common vegetation type observed throughout the Proposed Designation, and is characterised of a canopy dominated by kānuka, with common occurrences of tree ferns such as wheki, mamaku, silver fern which form dense fern treelands. Occasional canopy species include seven finger, putaputaweta, cabbage tree, lancewood (*Pseudopanax crassifolius*), gully tree fern (*Alsophila cunninghamii*), tree coprosma (*Coprosma arborea*). Emergent broadleaf and podocarp species such as kahikatea, rimu, tanekaha, totara, rewarewa, taraire, and Hall's tōtara (*Podocarpus laetus*) also occur occasionally, with these species becoming more frequent in Kānuka forest in an advanced successional stage. The subcanopy includes common occurrences of species mentioned in the canopy, red matipo, pigeonwood, nikau, and occasional occurrences of tree fuchsia (*Fuchsia excorticata*). The understory is comprised of a dense assemblage of native species. Frequently occurring and common species in the understory include red matipo, twiggy coprosma, hangehange, wheki, silver fern, kohekohe, thin-leaved coprosma, tall mingimingi, kiokio, large-leaved mahoe, and *Alseuosmia banksii* var. *banksii*. Occasional understory species include taraire, kanono, gully fern, lace fern, white maire, gorse, kawakawa, miro (*Pectinopitys ferruginea*), heketara (*Olearia rani* var. *colorata*), cutting sedge (*Gahnia pauciflora*), māpere (*Gahnia setifolia*), hīnau (*Elaeocarpus dentatus* var. *dentatus*), akepiro (*Shawia furfuracea*) and mangemange (*Lygodium articulatum*), forest cabbage tree (*Cordyline banksii*), wineberry, wineberry (*Aristotelia serrata*), Mairehau (*Leionema nudum*), and hebe (*Veronica macrocarpa* var. *macrocarpa*). Basket grass and thread fern are common components of the groundcover layer, with occasional species such as centella (*Centella uniflora*), nertera (*Nertera depressa*), *Nertera dichondrifolia*,

turutu (*Dianella nigra*), swamp blueberry (*Dianella haematica*), *Carex* spp. Orchids such as onion-leaved orchid and the winter greenhood (*Pterostylis alobula*) occur occasionally. In riparian areas, groundcover species such as parataniwha, gully fern and various *Blechnum* spp. becoming more frequent. Common epiphytes and lianas include akatea, drooping spleenwort, supplejack, bush lawyer, kiekie, bush lawyer, fork fern, white clematis (*Clematis paniculata*), climbing rātā (Metrosideros fulgens), fork fern, and *Tmesipteris elongata*.

Kānuka treeland/exotic scrub/ranked grassland

Description: Kānuka treeland was found across the heavily modified pastoral landscape that occurs across the Proposed Designation. The canopy is comprised of kānuka forming a discontinuous canopy, along with occasional totara and cabbage tree. The subcanopy and the understory layer is absent or sporadic due to the vegetation type often being unfenced and heavily grazed. Where understory species are present, common species include twiggy coprosma, hangehange, putaputaweta, kiokio, and occasional. Ranked grassland forms a dominant component in the groundcover layer with frequent occurrences of Japanese lady fern, basket grass, lace fern, and occasional occurrences of *Isolepis* spp., lotus, and self-heal. Bush lawyer occasionally occurs and is observed scrambling on low-stature shrubs.

Kauri-podocarp-broadleaf forest

Description: Kauri-podocarp-broadleaf consists of commonly to frequently occurring mature stands of kohekohe, karaka, taraire, rimu, rewarewa, hīnau, hall's tōtara, tawa (tawa (*Beilschmiedia tawa*), and occasional occurrences of miro and matai. Tanekaha is also commonly occurring, often forming dense stands on ridges, ridge crests, and well drained slopes. A diagnostic species for this vegetation type includes the common to occasional occurrence of large mature kauri on ridges and ridge faces. Kawaka (*Libocedrus plumosa*) trees also occur occasionally on these ridges. Common subcanopy species include the abovementioned species, and silver fern, nikau, wheki, tanekaha, heketara, pigeonwood, mamaku, red matipo, silver fern, mahoe, and wheki; with occasional occurrences of miro, lancewood and cabbage tree. Occasional species also include kauri associates such as white maire in the subcanopy/understory layer, maire taiki in the understory/groundcover layer, and the orchid – kauri greenhood (*Pterostylis agathicola*) in the groundcover layer. Frequent to common understory species include the saplings of the abovementioned species, along with tall mingimingi, kiekie, hangehange, large-leaved mahoe, kawakawa, karamū, taurepo (*Rhabdothamnus solandri*), *A. banksii* var. *banksii*, *Coprosma spathulate subsp. spathulata*, and the occasional occurrence of turutu, hebe, towai (*Pterophylla sylvicola*), mangemange, oak-leaved toropapa (*Alseuosmia quercifolia*), kumarahou (*Pomaderris kumeraho*), māpere, and rangiora (*Brachyglottis repanda*). Common groundcover species include basket grass, thread fern, hounds tongue, *Carex* spp., and *Austroblechnum membranaceum*. Frequent to common ferns in the lower strata tiers include shining spleenwort, kiokio, smooth shield fern, shaking brake, hairy fern (*Lastreopsis hispida*); and occasional occurring ferns include miniature tree fern (*Diploblechnum fraseri*), hen and chicken fern (*Asplenium bulbiferum*), crepe fern (*Leptopteris hymenophylloides*), drooping filmy fern (*Hymenophyllum demissum*), and *Lindsaea trichomanoides*. In riparian areas, the abovementioned fern species becoming increasingly more common, along with the dominance of parataniwha in riparian areas. Common epiphytes and lianas include tank lily, supplejack, bush lawyer, drooping spleenwort, hounds tongue, veined bristle fern, leather-leaf fern, perching lily (*Astelia solandri*), and various climbing rātā species (*M. perforata, M. diffusa, M. fulgens*). Occasionally occurring epiphytes include fragment fern (*Dendroconche scandens*), fork fern, *T. elongata*, bamboo orchid (*Earina mucronata*), Easter orchid (*Earina autmnalis*), winika (*Dendrobium cunninghamii*), and pygmy tree orchid (*Bulbophyllum pygmaeum*).

Kohekohe-taraire-tawa-podocarp/broadleaf forest

Description: Kohekohe-taraire-tawa-podocarp/broadleaf forest is a common indigenous vegetation type that occurred throughout the Proposed Designation and is associated with large contiguous areas of the Brynderwyn Hills – especially the ONL immediately north of the Piroa Stream. It is characterised by a canopy dominant with kohekohe, taraire and tawa; with occasional to frequent occurrences of rewarewa, rimu, hīnau, hall's tōtara, kānuka, kahikatea; and occasional occurrences of miro and kawaka. Kauri and other kauri associates also occurs occasionally in the canopy, although is scarce relative to occurrences in Kauri-podocarp-broadleaf forest. Common subcanopy species include species observed in the canopy,

and silver fern, nikau, heketara, pigeonwood, wheki, red matipo, lancewood, karamū, kanono, māhoe, and large-leaved māhoe. Frequent to common understory species include species mentioned in the above strata levels, and kiekie, taurepo, hangehange, wheki, tree coprosma, and *A. banksii* var. *banksii*. Occasionally occurring understory species that were observed included kanono, taurepo, kawakawa, and oak-leaved toropapa, and tall mingimingi. Species such as kiokio, gully fern, thread fern, *A. membranaceum,* and parantaniwha was a common component in riparian and wet areas. Basket grass formed a common to dominant coverage in the ground cover layer, alongside other native regenerating species mentioned above. Large nest epiphytes such as tank lily and perching lily are common, in particularly on large mature trees, alongside common epiphytes observed in other contiguous bush areas within the Preferred Designation including, supplejack, bush lawyer, drooping spleenwort, hounds tongue, veined bristle fern, leather-leaf fern, perching lily (*Astelia solandri*), and various climbing rātā species (*M. perforata, M. diffusa, M. fulgens*). Occasionally occurring epiphytes include fork fern, *T. elongata*, bamboo orchid (*Earina mucronata*), Easter orchid (*Earina autmnalis*), winika (*Dendrobium cunninghamii*), and pygmy tree orchid (*Bulbophyllum pygmaeum*).

Lawson's cypress-exotic pine treeland

Description: Lawson's cypress-exotic pine treeland is characterised by the co-dominance of Lawson's cypress (*Chamaecyparis lawsoniana*) and radiata pine (*Pinus radiata*) in the canopy. Subcanopy species were scarce but included the occasional occurrence of mamaku, silver fern, seven finger, kohekohe and poplar. Frequent understory species included hangehange, seven finger, twiggy coprosma and silver fern. Rank grassland was the dominant ground cover type, with frequent occurrences of Japanese lady fern, kiokio, gully fern, basket grass, and occasional occurrences of exotic pasture species such as purple foxglove, buttercup, and lotus.

Macrocarpa/mixed native and exotic scrub/ranked grassland

Description: Macrocarpa/mixed native and exotic scrub/ranked grassland is comprised of a monotypic canopy dominated by macrocarpa (*Hesperocyparis macrocarpa*) and an absent subcanopy. The understory was typically sparse, although in areas where the understory component was present, common understory species included red matipo, and lemonwood, kawakawa, and mahoe which occurred occasionally. Due to the vegetation type often being unfenced, the ground layer tier was typically dominated by rank grassland and occasional exotic pasture species.

Mixed exotic-native scrub and hedgerow scrub

Description: Mixed exotic-native scrub is a broad vegetation type that encompasses a mixed assemblage of exotic and native species that are used to form hedgerows, shelterbelts and roadside banks across the Proposed Designation. Species composition is typically a variable mix of low-stature exotic and native species. Canopy coverage varies, and ranges from being completely absent to remnant native trees forming a discontinuous canopy. Frequently observed species in the canopy include tree privet, tōtara, cabbage tree, māhoe, kānuka, lily pily (*Syzygium smithii*), and *Metrosideros collina*. Understory species include commonly observed ornamental and garden plants, along with agapanthus, harakeke, sod's balsam, and hawthorn (*Crataegus monogyna*). Occasional native regenerating species may occur in the understory and include silver fern and mahoe. Ground cover species are typically absent due to the dense coverage of exotic shrubs or may be completely absent due to grazing from cattle.

Mixed tall exotic shelterbelt treeland

Description: Mixed tall exotic shelterbelt treeland is a broad vegetation type that encompasses a variable mix of commonly observed trees used as shelterbelts. This includes the occasional occurrence of poplar, crack willow, oak (*Quercus robur*), liquidambar (*Liquidambar styraciflua*), and coral tree (*Erythrina ×sykesii*) forming a discontinuous canopy. Subcanopy and understory layers are typically absent, with a groundcover layer dominated by ranked grass and other occasional exotic pasture species observed elsewhere in the Designation.

Nīkau treeland

Description: Nīkau treeland was only observed at chainage 16713 and involved a discontinuous treeland canopy of Nīkau with an absence of other structural tiers. Rank grassland forms the dominant ground cover component in the understory layer.

Ornamental plantings and gardens

Description: The Proposed Designation contained numerous ornamental gardens and plantings which surround private residences. This broad vegetation encompasses the various gardens observed throughout the Proposed Designation, which is characterised by an assemblage of planted exotic and native species, and an absence of typical forest tiers. Frequently observed trees include various exotic fruit trees, poplar, oak, *Pinus* spp., *Prunus* spp., *Acacia* spp., Olive (*Olea europaea*), macadamia (*Macadamia integrifolia*), Norfolk Island pine *(Araucaria heterophylla*), and Queen palm (*Syagrus romanzoffiana*). Frequently observed species understory plants include agapanthus, harakeke (*Phormium tenax*), clivia (*Clivia miniata*), bromeliads (*Neoregelia* spp.) and roses (*Rosa* sp.)

Planted native vegetation

Description: Planted native vegetation was a broad vegetation type found across the Proposed Designation. The vegetation type includes native species planted for restoration planting, planted natives around riparian areas, and large native plantations (i.e. the manuka plantation at chainage 9313). Diagnostic features of this vegetation type include plants spaced at conspicuous, regular, and uniform intervals. It includes occasional canopy species such as kānuka, tōtara, macadamia, radiata pine, and young plants of cabbage tree, harakeke, jointed wire rush (*Apodasmia similis*), purei (*Carex secta*), mānuka (*Leptospermum scoparium* var. *scoparium*), taupata (*Coprosma repens*), ngaio (*Myoporum laetum*), sand coprosma (*Coprosma acerosa*), kōhūhū (*Pittosporum tenuifolium*) and *Corokia* × *virgata*.

Poplar treeland/exotic scrub/ranked grassland

Description: Poplar treeland/exotic scrub/ranked grassland was a common vegetation type found in the Proposed Designation. It is comprised of various poplar species (*Populus* spp.) typically planted as shelterbelts. Other occasional shelterbelt species occasionally occur and include crack willow, *Eucalyptus* spp., and Italian Alder (*Alnus cordata*). The subcanopy and understory structural tier is typically absent due to its occurrence in highly modified pastoral landscapes or due to intensive grazing. Occasional subcanopy species include kahikatea and younger planted shelterbelt species i.e. Italian Alder. Native regeneration species such as kahikatea, karaka, and nikau occasionally occur in the understory. Ranked grassland is dominant in the ground cover tier with occasional occurrences of Japanese lady fern, shining spleenwort and shaking brake in particularly wet areas.

Pūriri forest/ranked grassland

Description: Numerous small Pūriri forest/ranked grassland remnants were observed in the Proposed Designation. It is comprised of a heavily modified Pūriri forest ecosystem and is characterised by a dominance of Pūriri trees in the canopy with occasional occurrences of small-leaved kōwhai and miro. Due to grazing, the subcanopy and understory layers are typically absent. Although, scarce occurrences of regenerating red matipo, nikau, twiggy coprosma, shaking brake and small-leaved kōwhai occur in the understory layer. Weeds such as Chinese privet occurr occasionally. Ranked grassland formed the dominant component in the groundcover layer with exotic pasture species occurring sporadically. Large epiphytic tank lily clumps are dominant on large Pūriri trees.

Redwood treeland/ranked grassland

Description: The canopy of Redwood treeland/ranked grassland is comprised of redwood (*Sequoia sempervirens*) which occurred as a co-dominant, alongside radiata pine and tōtara. Subcanopy species were typically absent. Dense understory plants were typically scarce, but include the frequent occurrence of karaka, Chinese privet and tree privet; and the occasional occurrence of kawakawa and karo. The groundcover tier was dominated by ranked grassland species, and exotic weeds such as tradescantia and onion weed.

Remnant Riparian podocarp-hardwood-kanuka treeland

Description: Remnant Riparian podocarp-hardwood-kanuka treeland was the dominant riparian vegetation type along the Ahuroa River and Waihoihoi River. The canopy was dominated by tōtara, with frequently occurring pūriri and taraire. Occasional canopy species include rewarewa, kohekohe, kahikatea, miro, small-leaved milk tree, and kānuka. Diagnostic species include the occasional occurrence of riparian forest species such as semi-mature/mature coastal kōwhai (*Sophora* chathamica), lowland ribbonwood (*Plagianthus regius* subsp. *regius*) and tītoki. Due to its modified nature, the subcanopy layer was sporadic but frequently include kohekohe and tōtara; and occasional occurrences of Chinese privet, kānuka and cabbage trees. Vegetation in the understory layer is sporadic in many areas due to grazing, but include frequent occurrences of twiggy coprosma, tree coprosma, *C. spathulata* subsp. *spathulata*, taurepo, and Chinese privet, and toatoa. In the understory, red matipo, karaka, kawakawa, *Coprosma rotundifolia*, small-leaved milk tree, and regenerating lowland ribbonwood occur occasionally. Weeds are frequent, and include species such as ginger, lily pily, onion weed, and Jerusalem cherry. In the groundcover layer, ranked grassland is dominant, alongside the frequent to common occurrence of *Carex* spp., buttercup, thread fern, basket grass, rasp fern, and tradescantia. Occasional groundcover species include Austral lady fern (*Diplazium australe*) and rosy maidenhair. Tradescantia forms a dominant cover in some areas, smothering all other groundcover species. Japanese lady fern was also common, forming sporadic dense patches in riparian flats, depressions and wet areas. The 'At-Risk – Naturally Uncommon' fern - mokimoki (*Doodia mollis*) was found in riparian areas across the Ahuroa river. Epiphytes were commonly observed on mature trees, and included tank lily, leather-leaf fern, hounds tongue, fragrant fern, and drooping spleenwort which occurred frequently. Lianas such as pōhuehue occurred frequently and was observed scrambling on low stature shrubs. Occasional liana species included New Zealand jasmine (*Parsonsia heterophylla*) and clematis (*Clematis foetida*).

River she-oak shelterbelt

Description: River she-oak shelterbelt is comprised of a dominant canopy of river she-oak trees planted to form a shelterbelt. Other occasional canopy species include other exotic trees used in conjunction to form a shelterbelt. This includes species such as macrocarpa, radiata pine, and poplar. Subcanopy and understory species are typically absent. The groundcover layer is comprised of ranked grassland with occasional exotic species. Other common groundcover species include tradescantia, which form dense occasional mats. The exotic vine - pink jasmine (*Jasminum polyanthum*) was frequently observed climbing on mature river she-oak trees.

Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland

Description: Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland is a broad classification type that is characterised by scattered remnants of native trees in pastoral and other highly modified landscapes. It includes a discontinuous canopy of frequent species such as tōtara, kānuka, kahikatea, pūriri, kahikatea, and karaka. Subcanopy and understory layers are typically sparse due to intense grazing pressure but include occasional occurrences of twiggy coprosma, putaputaweta and gorse. Occasional occurrences of other native regenerating species occur from dispersal from neighbouring fragments. The groundcover is typically heavily pugged but comprises of ranked grassland, occasional exotic pasture species, and rasp fern.

Tōtara forest/native broadleaf scrub

Description: Tōtara forest/native broadleaf scrub is a successional example of anthropic tōtara forest and is typically an example of landowners fencing off tōtara forest fragments, allowing the understory to regenerate. The vegetation type is characterised by a canopy dominated by tōtara, with frequent to occasional kānuka. Other occasional canopy species include rewarewa and rimu. Common subcanopy species include māhoe and pigeonwood; frequent species include cabbage tree; and occasional species include kohekohe, tōtara, kōhūhū, and lily pily, rewarewa, tree coprosma, and lancewood. Frequent to common native understory species that occur include silver fern, red matipo, twiggy coprosma, hangehange, and tree coprosma. Occasional native understory species include taraire, karo, kōhūhū, tall mingimingi, nikau, kanono, karaka, titoki, tanekaha, A. banksii var. banksii, and swamp coprosma (Coprosma tenuicaulis). Many remnants of Tōtara forest/native broadleaf scrub are modified and are subject to edge effects, thus, exotic weeds are common occurrences in remnants. Frequent to common

exotic weed species include Chinese privet, arum lily, ginger, ladder fern (*Nephrolepis cordifolia*), and Japanese spindleberry (*Euonymus japonicus*). Occasional exotic weed species include English ivy, cotoneaster (*Cotoneaster glaucophyllus*), and Germany ivy (*Delairea odorata*). Groundcover species includes tradescantia which dominate large areas in remnants, and basket grass, thread fern, and *Carex* spp. which occur commonly. Occasional groundcover species include rasp fern, kiokio, kiekie, gully fern, shinning spleenwort, hounds tongue, and Mercury Bay weed (*Dichondra repens*). Frequent lianas and epiphytes include New Zealand Jasmine, thread fern, white clematis, supplejack, hounds tongue, leather-leaf fern, pōhuehue, and Madeira vine (*Anredera cordifolia*).

Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland

Description: The Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland vegetation type had a similar vegetation composition observed in highly modified vegetation types (i.e. Anthropic tōtara forest, Kānuka treeland/exotic scrub/ranked grassland). This includes a canopy comprised of co-dominating Tōtara and kānuka, often forming occasional continuous stands of the one species. Occasional canopy species include kahikatea and rimu. The subcanopy is typically absent. The understory layer is typically sparse due to high grazing pressure. In areas where grazing pressure is reduced, twiggy coprosma, blackberry and Mexican devil commonly occur, with occasional occurrences of silver fern, barberry, and karamū, Japanese lady fern is common in areas that are wet. The groundcover is dominated by rank grassland, with occasionally occuring exotic pasture species such as buttercup, rasp fern, ragwort, white clover and lotus.

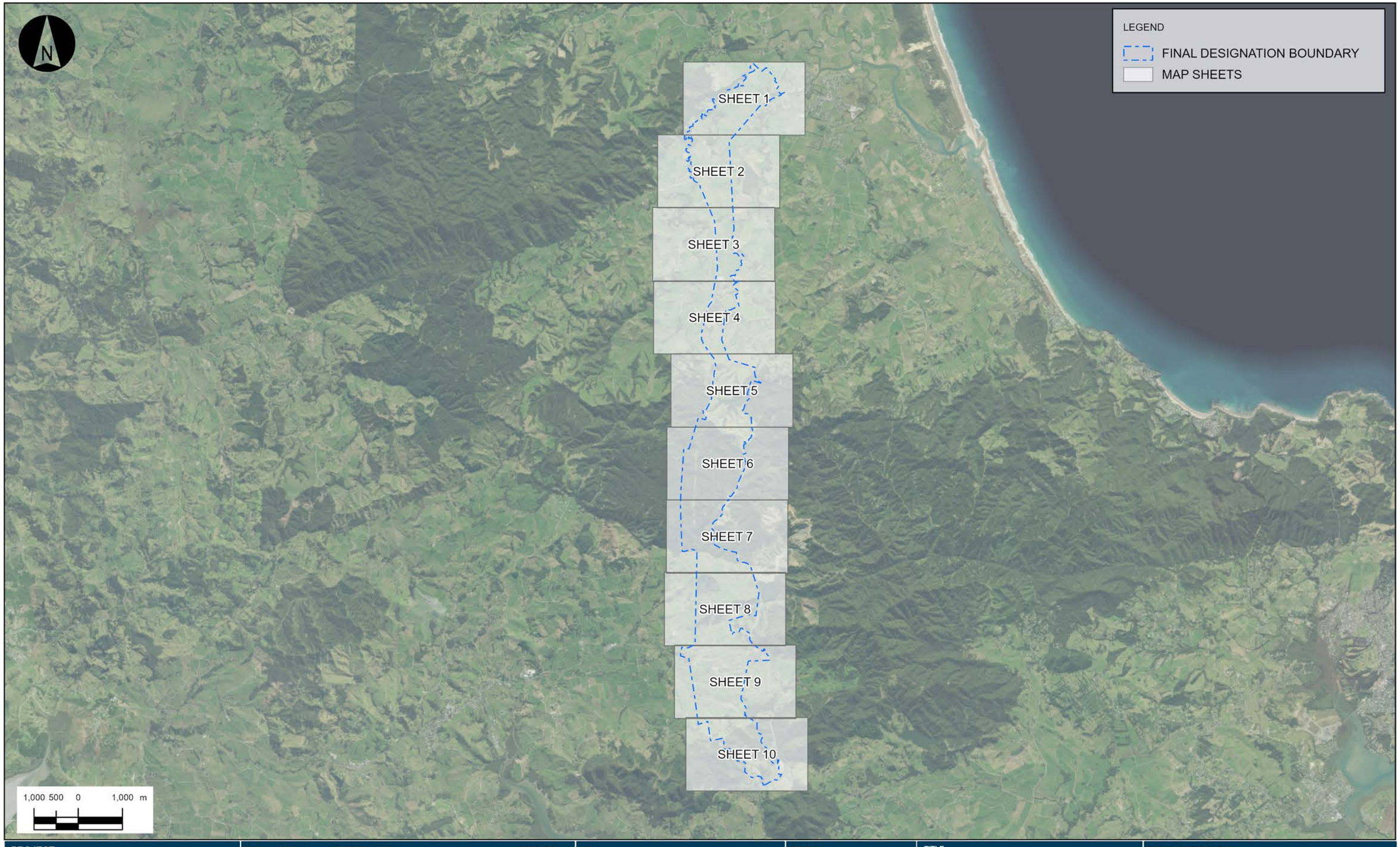
Tōtara-kauri/broadleaf scrub

Description: Tōtara-kauri/broadleaf scrub is characterised by tōtara forming a dominant canopy cover with occasional remnant large kauri trees. Other occasional canopy species include rimu, kahikatea, tawa, pine, taraire, tanekaha, rewareware and emergent mamaku. Radiata pine also occasionally occurs, in particular on the boundaries of neighbouring vegetation types dominated by radiata pine. Common subcanopy species include seven finger, māhoe, hangehange, red matipo, silver fern, and pigeonwood. Occasional kauri associates occur in the subcanopy and understory and include white maire and maire taiki (*Mida salicifolia*). The understory typically includes a dense layer of native species, including hangehange, pigeonwood, silver fern, red matipo, twiggy coprosma, and shining spleenwort which are commonly occurring. Occasional species include karaka, pūriri, nikau, kawakawa, rewarewa, kawakawa, kohekohe, water fern, thin-leaved coprosma, putaputaweta, tree coprosma, *C. spathulata* subsp. *spathulata,* and *Coprosma rigida*. Exotic weeds such as Elaeagnus ×reflexa, arum lily, and lily pily are frequent. Common groundcover species include basket grass, centella, shaking brake, hounds tongue, rasp fern, smooth shield fern, and commonly observed exotic pasture species that have dispersed from neighbouring areas. In particularly wet areas, Japanese lady fern, kiokio, and thread fern occur frequently.

Rank grassland

Description: The Proposed Designation consists of vast areas of open modified landscapes dominated by the ranked grassland vegetation type. Ranked grassland was also a common component in the groundcover layer of many other vegetation types and indigenous forest remnants. It includes dominant grass species such as kikuyu; and frequent to commonly occurring species such as cocksfoot, Yorkshire fog, ryegrass, veldt grass, annual poa, rat's tail (*Sporobolus africanus*) and sweet vernal grass (*Anthoxanthum odoratum*). Exotic pasture species are common components of the ranked grassland vegetation type and are typically interspersed amongst grass species or sporadically occur in areas where the groundcover opens up. Common exotic pasture species include foxglove, white clover, narrow-leaved plantain, ragwort, scotch thistle, self-heal, lotus, buttercup, broad-leaved dock, gorse, dandelion (*Taraxacum officinale* agg.), English daisy (*Bellis perennis*), bittercress (*Cardamine hirsuta*), and Indian strawberry (*Potentilla indica*).

Appendix E
Vegetation Types



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	27/03/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:80,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	27/03/2026
CHECKED	H. SANTOS	27/03/2026
REVIEWED	L. DENMEAD	27/03/2026
VERIFIED	H. SANTOS	27/03/2026
PROJECT LEAD	J. HIND	27/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	27/03/2026

TITLE

BRYNDERWYN HILLS SECTION VEGETATION AND BAT HABITAT OVERVIEW MAP

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1165

SCALE	SIZE	REFERENCE NO.	REV
1:80,000	A3	PE-1165	C

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 1 OF 10

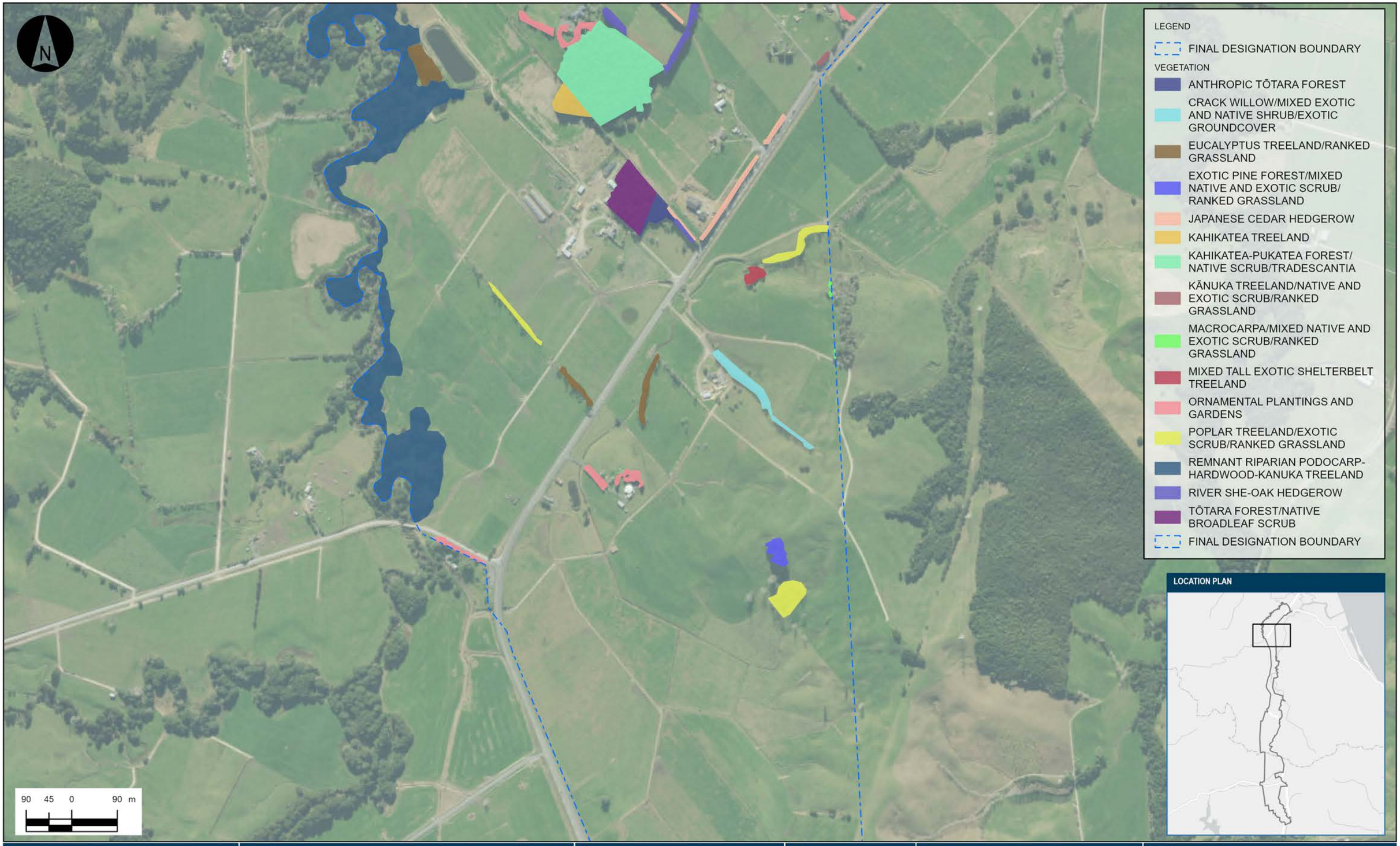
PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1166

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1166	C



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 2 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1167

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1167	C

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS

FOR INFORMATION

APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 3 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1168

SCALE	SIZE	REFERENCE NO.	REV
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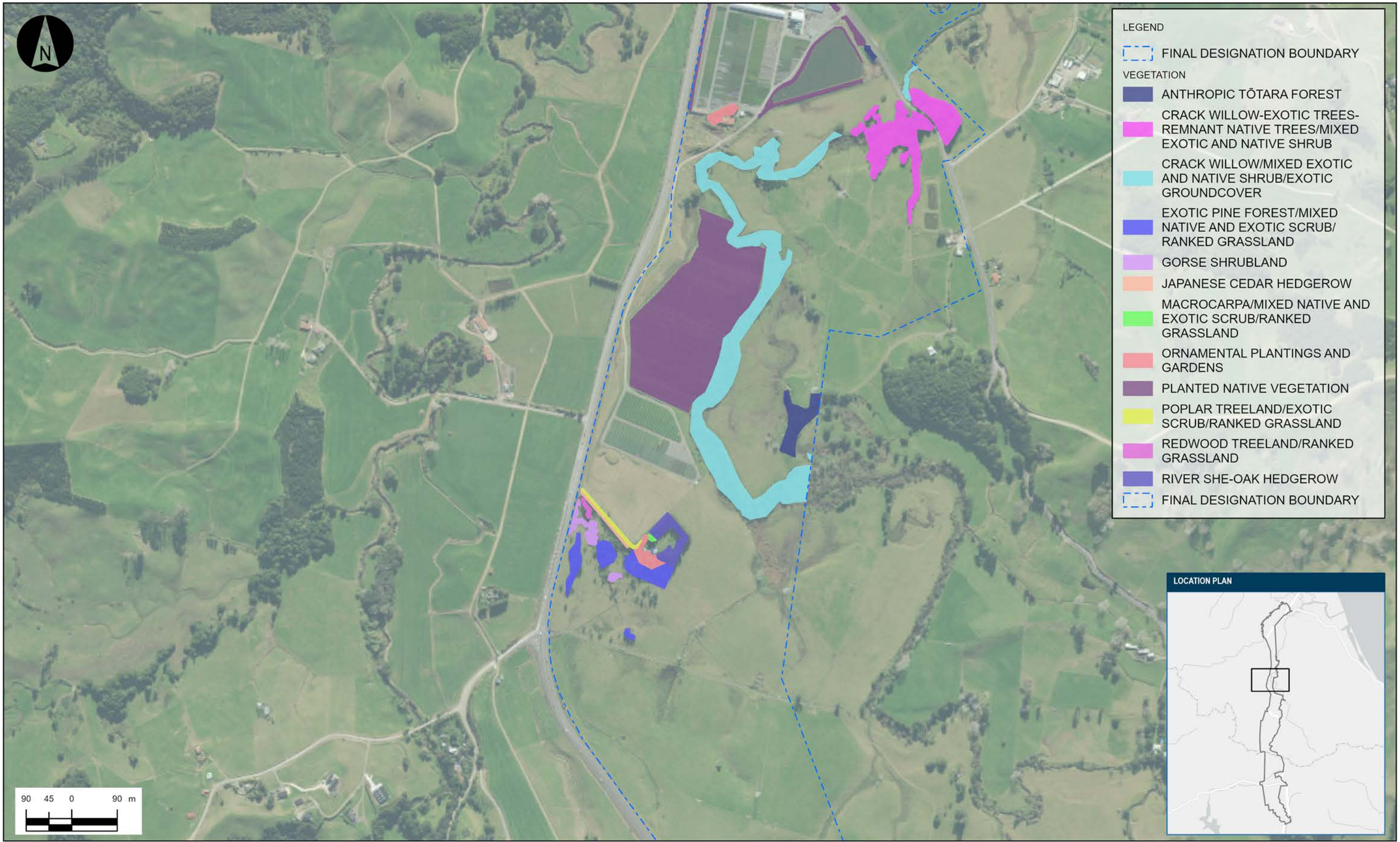

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 4 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1169

SCALE	SIZE	REFERENCE NO.	REV
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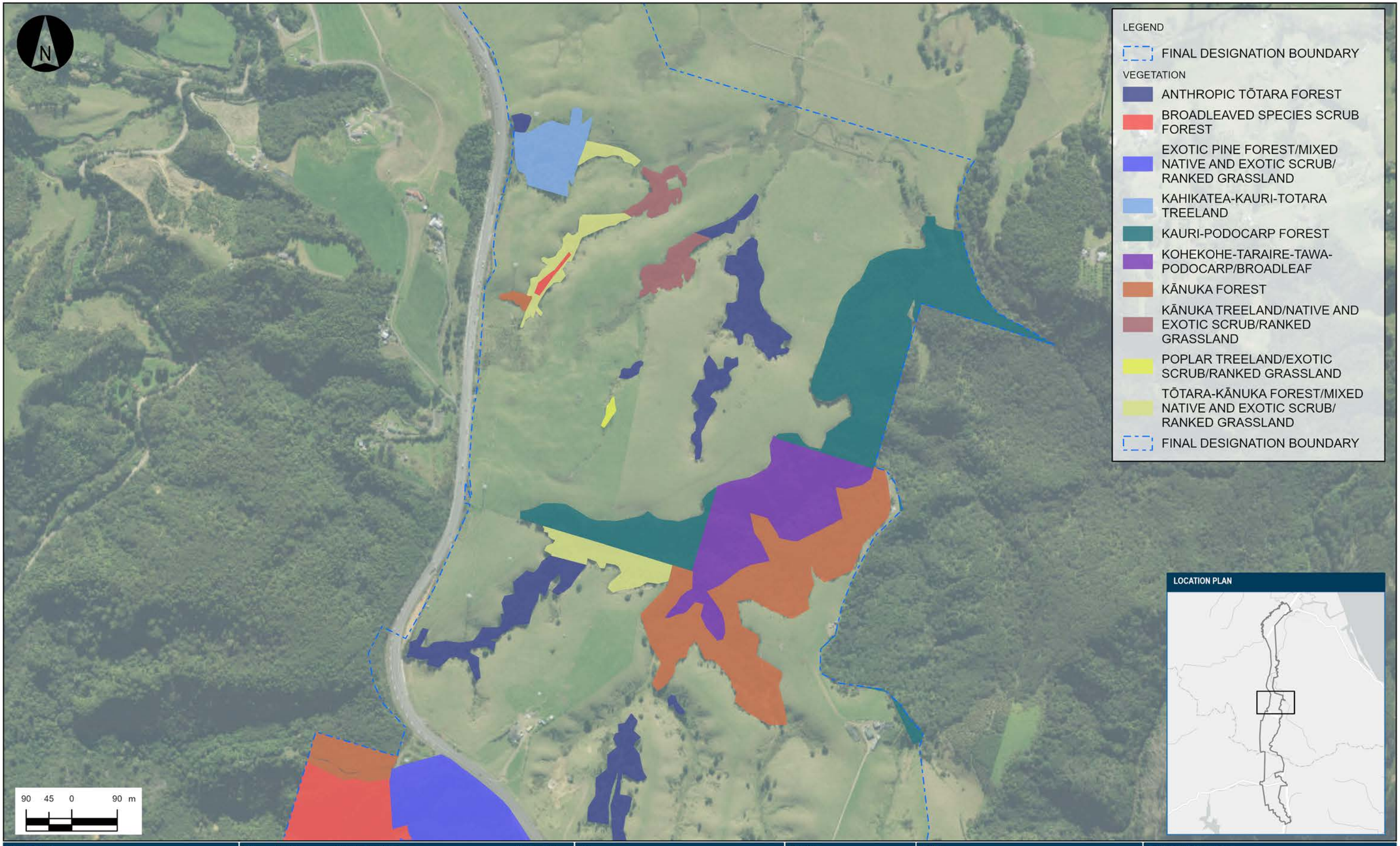


PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 5 OF 10

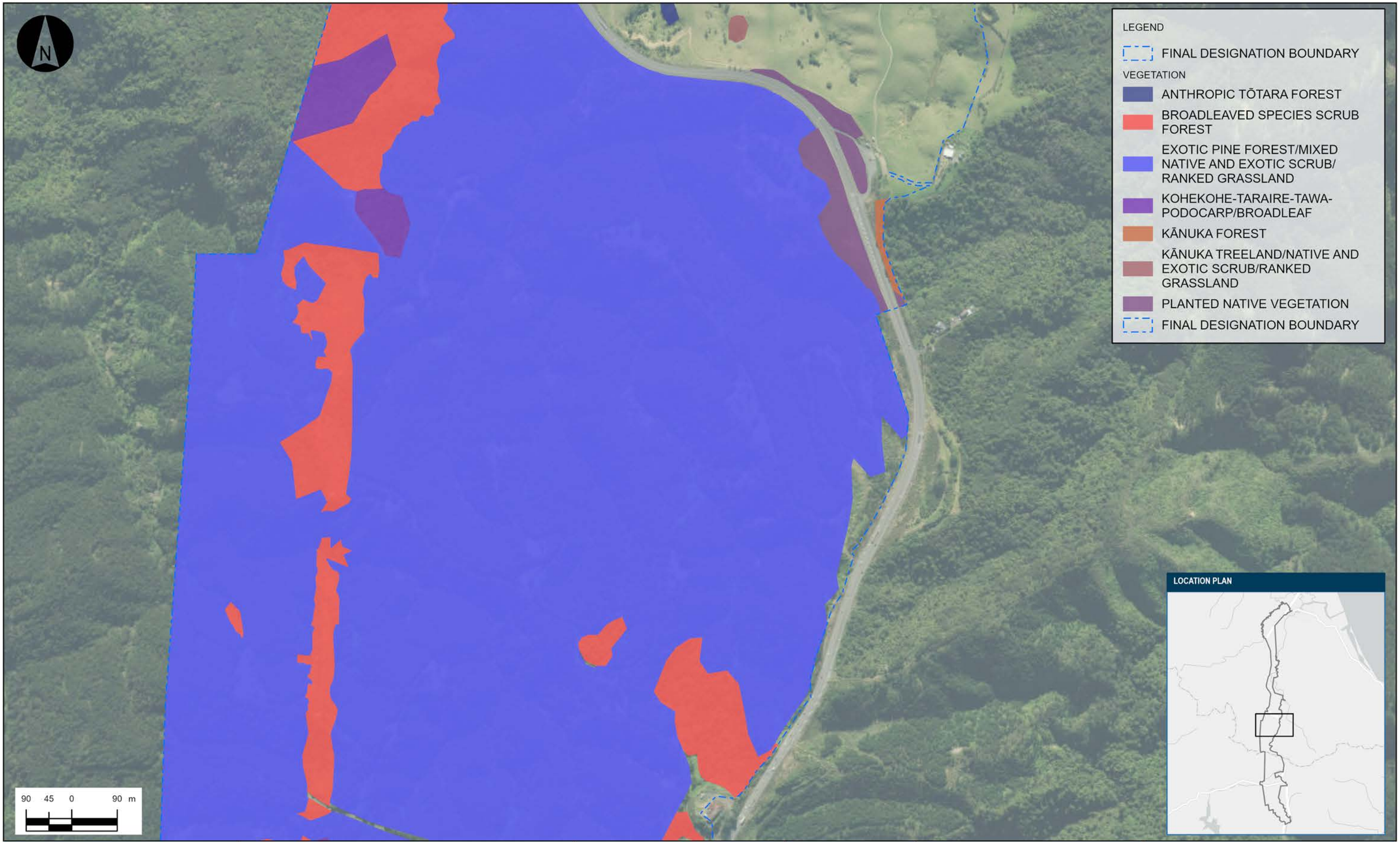
PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1170

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1170	C



PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

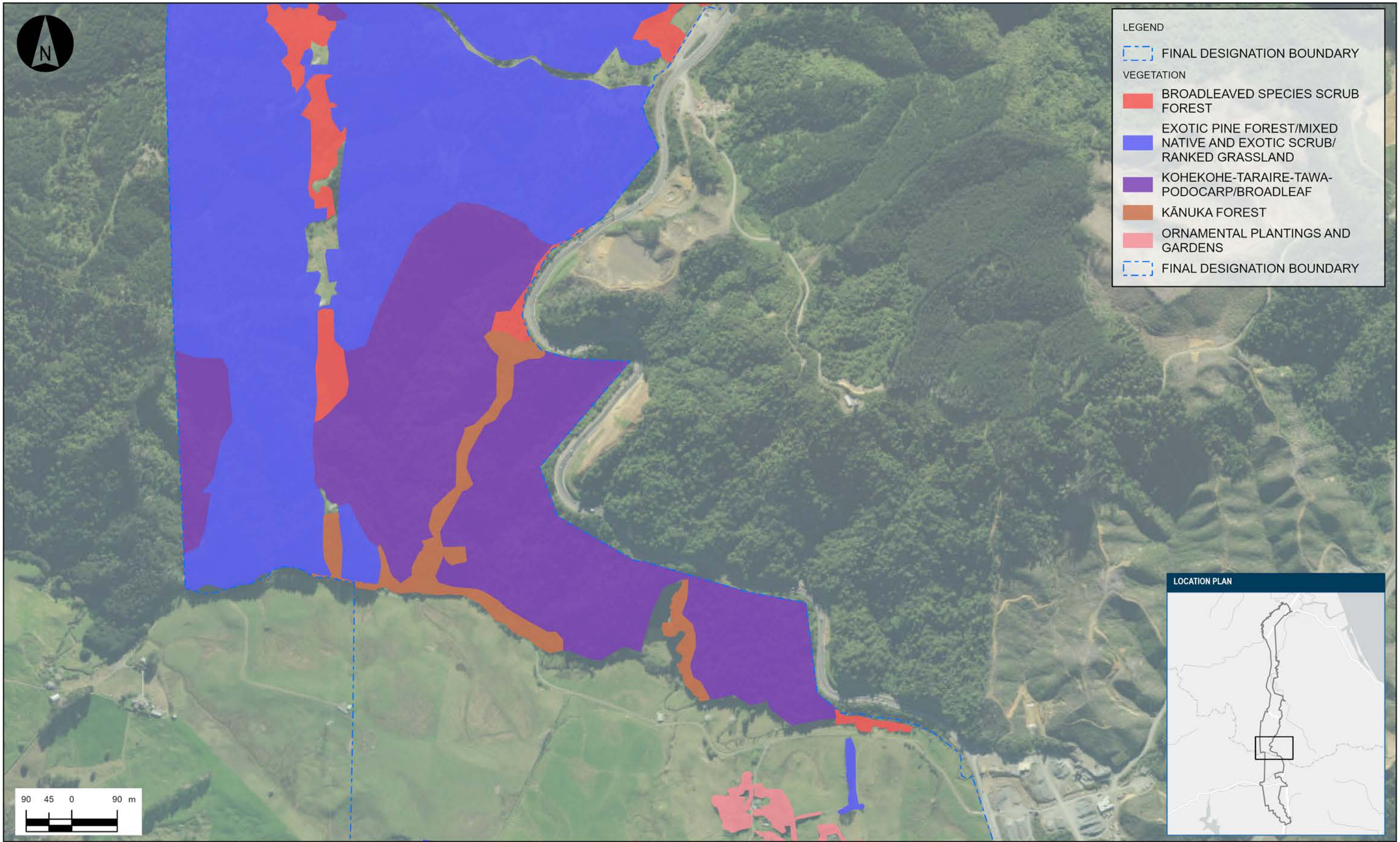
REV	DATE	REVISION DETAILS	APPROVED
A	23/01/2026	FOR INFORMATION	RDP
B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS
FOR INFORMATION
APPROVED
R. DU PLOOY
APPROVED BY — DATE
R. DU PLOOY — 1/04/2026

TITLE
BRYNDERWYN HILLS SECTION VEGETATION TYPES SHEET 6 OF 10

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1171			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1171	C



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 7 OF 10

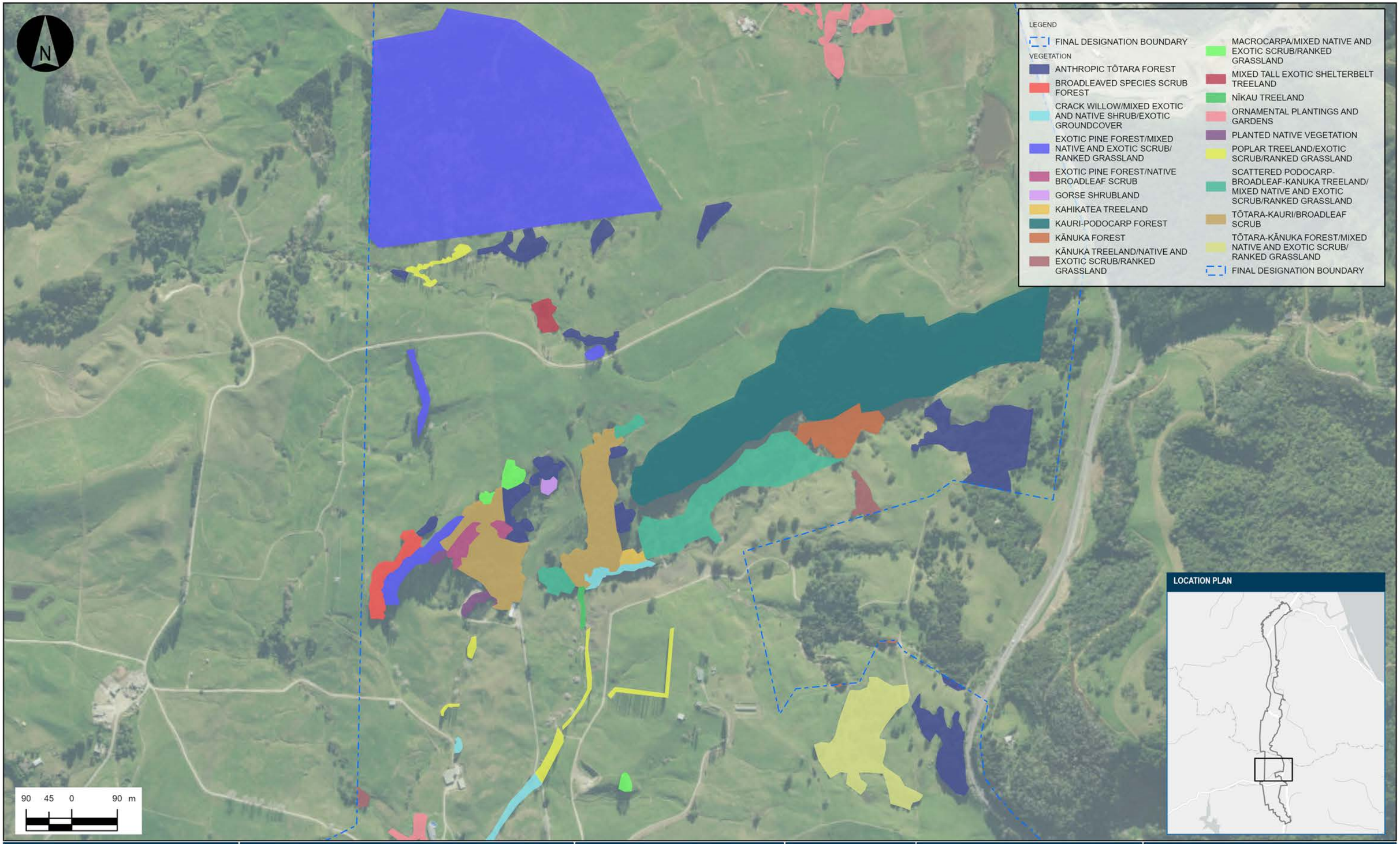
PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1172

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1172	C



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 8 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1173

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1173	C

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

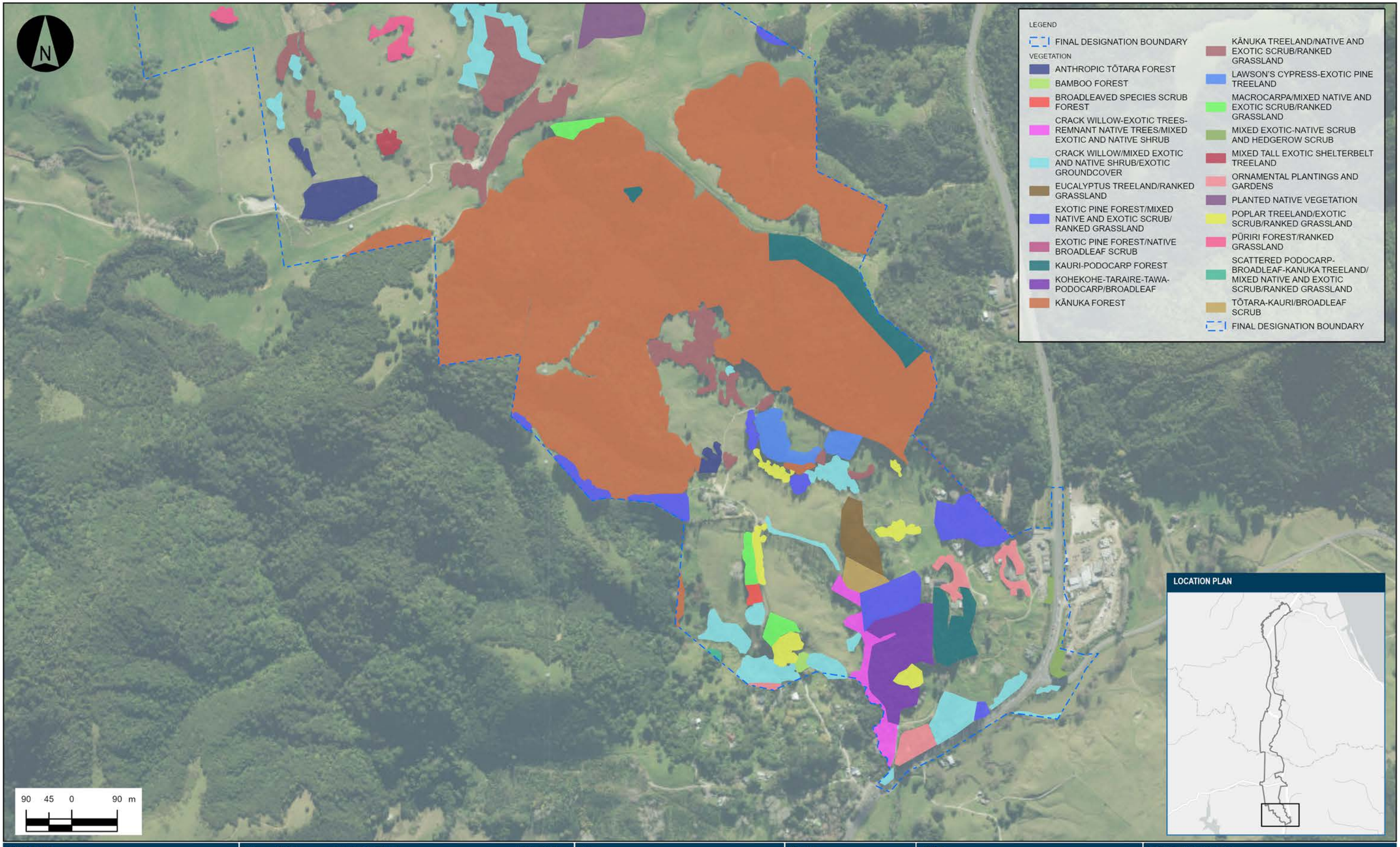
TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 9 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1174			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1174	C



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS		
FOR INFORMATION		
APPROVED		
R. DU PLOOY		
APPROVED BY	DATE	
R. DU PLOOY	1/04/2026	

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION TYPES
SHEET 10 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1175

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1175	C

Appendix F
Summary of Vegetation Types and Values

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V1_61	Anthropic tōtara forest	0.07	Low
V1_62	Ornamental plantings and gardens	0.09	Negligible
V1_63	Remnant Riparian podocarp-hardwood-kanuka treeland	0.40	Low
V1_64	Ornamental plantings and gardens	0.01	Negligible
V1_65	Anthropic tōtara forest	0.11	Low
V1_66	Kahikatea treeland	0.51	High
V1_67	Anthropic tōtara forest	0.05	Low
V1_68	Anthropic tōtara forest	0.04	Low
V1_69	Kahikatea treeland	0.08	Moderate
V1_70	Anthropic tōtara forest	0.08	Negligible
V1_71	Kahikatea treeland	0.28	High
V1_72	Kahikatea treeland	0.12	High
V1_73	Ornamental plantings and gardens	0.05	Low
V1_74	Kahikatea forest	0.44	Very High
V1_75	Anthropic tōtara forest	0.10	Low
V1_76	Kahikatea treeland	1.20	High
V1_77	Kahikatea treeland	0.34	High
V1_78	Ornamental plantings and gardens	0.03	Negligible
V1_79	Remnant Riparian podocarp-hardwood-kanuka treeland	2.30	High
V1_80	Kahikatea treeland	0.07	Moderate
V1_81	Kahikatea treeland	0.07	Moderate
V1_82	Anthropic tōtara forest	0.35	Low
V1_83	Kahikatea treeland	0.31	High
V1_84	Kahikatea forest	0.57	Very High
V1_85	Kahikatea treeland	0.28	High
V1_86	Anthropic tōtara forest	0.07	Low
V1_87	Kahikatea treeland	0.40	High
V1_88	Ornamental plantings and gardens	0.21	Negligible
V1_89	Anthropic tōtara forest	0.03	Low
V1_90	Anthropic tōtara forest	0.24	Low
V1_91	Anthropic tōtara forest	0.05	Low
V1_92	Anthropic tōtara forest	0.11	Low
V1_93	Mixed exotic-native scrub and hedgerow scrub	0.04	Negligible
V1_94	Ornamental plantings and gardens	0.17	Negligible
V1_95	Anthropic tōtara forest	0.05	Low
V1_96	Mixed exotic-native scrub and hedgerow scrub	0.02	Negligible
V1_97	Ornamental plantings and gardens	0.08	Negligible
V1_98	Mixed exotic-native scrub and hedgerow scrub	0.01	Negligible
V1_99	Anthropic tōtara forest	0.44	Low
V1_100	Bamboo forest	0.02	Negligible
V1_101	Anthropic tōtara forest	0.09	Low

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V1_102	Mixed exotic-native scrub and hedgerow scrub	0.04	Negligible
V1_103	Mixed tall exotic shelterbelt treeland	0.01	Negligible
V1_104	Ornamental plantings and gardens	0.14	Negligible
V1_105	Mixed exotic-native scrub and hedgerow scrub	0.03	Negligible
V1_106	Anthropic tōtara forest	0.04	Low
V1_107	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.00	Negligible
V1_108	Anthropic tōtara forest	0.02	Low
V1_111	Anthropic tōtara forest	0.04	Low
V1_112	Anthropic tōtara forest	0.21	Low
V1_113	Anthropic tōtara forest	1.44	Low
V1_114	Remnant Riparian podocarp-hardwood-kanuka treeland	2.78	High
V1_115	Anthropic tōtara forest	0.06	Low
V1_116	Anthropic tōtara forest	0.67	Low
V1_117	Anthropic tōtara forest	0.09	Low
V1_118	Mixed exotic-native scrub and hedgerow scrub	0.14	Low
V1_119	Anthropic tōtara forest	1.23	Low
V1_120	River she-oak hedgerow	0.08	Negligible
V1_121	Poplar treeland/exotic scrub/ranked grassland	0.10	Negligible
V1_122	Japanese cedar hedgerow	0.24	Negligible
V1_123	Ornamental plantings and gardens	0.04	Negligible
V1_124	Ornamental plantings and gardens	0.06	Negligible
V1_125	Ornamental plantings and gardens	0.29	Negligible
V1_126	Mixed exotic-native scrub and hedgerow scrub	0.01	Low
V1_127	River she-oak hedgerow	0.06	Negligible
V1_128	Mixed exotic-native scrub and hedgerow scrub	0.03	Negligible
V1_129	Ornamental plantings and gardens	0.14	Negligible
V1_130	Mixed exotic-native scrub and hedgerow scrub	0.04	Low
V1_131	Ornamental plantings and gardens	0.09	Negligible
V1_132	River she-oak hedgerow	0.09	Negligible
V1_134	Ornamental plantings and gardens	0.06	Negligible
V1_135	Mixed exotic-native scrub and hedgerow scrub	0.08	Low
V1_136	Japanese cedar hedgerow	0.11	Negligible
V1_137	River she-oak hedgerow	0.42	Negligible
V1_138	Ornamental plantings and gardens	0.04	Negligible
V1_139	River she-oak hedgerow	0.09	Negligible
V1_140	Ornamental plantings and gardens	0.09	Negligible
V1_141	Ornamental plantings and gardens	0.13	Negligible
V1_142	Kānuka treeland/native and exotic scrub/ranked grassland	0.03	Low
V1_143	Eucalyptus treeland/ranked grassland	0.27	Negligible
V1_144	Kahikatea-pukatea forest/native scrub/tradescantia	2.54	Very High
V1_145	Kahikatea treeland	0.26	Moderate
V1_148	Japanese cedar hedgerow	0.06	Negligible
V1_151	Japanese cedar hedgerow	0.15	Negligible
V1_152	Tōtara forest/native broadleaf scrub	0.78	Moderate
V1_153	Anthropic tōtara forest	0.19	Low

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V1_154	Japanese cedar hedgerow	0.03	Negligible
V1_155	River she-oak hedgerow	0.04	Negligible
V1_156	Poplar treeland/exotic scrub/ranked grassland	0.20	Negligible
V1_158	Mixed tall exotic shelterbelt treeland	0.09	Negligible
V1_159	Remnant Riparian podocarp-hardwood-kanuka treeland	7.66	High
V1_160	Macrocarpa/mixed native and exotic scrub/ranked grassland	0.02	Negligible
V1_161	Poplar treeland/exotic scrub/ranked grassland	0.10	Negligible
V1_162	Eucalyptus treeland/ranked grassland	0.09	Negligible
V1_163	Crack willow/mixed exotic and native shrub/exotic groundcover	0.33	Negligible
V1_164	Eucalyptus treeland/ranked grassland	0.14	Negligible
V1_166	Ornamental plantings and gardens	0.09	Negligible
V1_167	Ornamental plantings and gardens	0.07	Negligible
V1_169	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.15	Negligible
V1_170	Ornamental plantings and gardens	0.08	Negligible
V1_171	Poplar treeland/exotic scrub/ranked grassland	0.31	Negligible
V1_174	Anthropic tōtara forest	0.11	Low
V1_175	Tōtara forest/native broadleaf scrub	1.46	High
V1_176	Tōtara forest/native broadleaf scrub	0.59	Moderate
V1_177	Poplar treeland/exotic scrub/ranked grassland	0.18	Negligible
V1_178	Poplar treeland/exotic scrub/ranked grassland	0.20	Negligible
V1_179	Poplar treeland/exotic scrub/ranked grassland	0.05	Negligible
V1_180	Ornamental plantings and gardens	0.03	Negligible
V1_181	Poplar treeland/exotic scrub/ranked grassland	0.05	Negligible
V1_182	Poplar treeland/exotic scrub/ranked grassland	0.06	Negligible
V1_183	Planted native vegetation	0.51	Low
V1_186	Planted native vegetation	0.07	Negligible
V1_187	Anthropic tōtara forest	0.03	Low
V1_188	Crack willow/mixed exotic and native shrub/exotic groundcover	0.06	Negligible
V1_189	Planted native vegetation	0.27	Negligible
V1_190	Crack willow-exotic trees-remnant native trees/mixed exotic and native shrub	0.49	Low
V1_191	Ornamental plantings and gardens	0.11	Negligible
V1_192	Crack willow-exotic trees-remnant native trees/mixed exotic and native shrub	1.16	Moderate
V1_193	Planted native vegetation	5.64	Low
V1_194	Anthropic tōtara forest	0.43	Negligible
V1_195	Crack willow/mixed exotic and native shrub/exotic groundcover	4.02	Low
V1_197	Redwood treeland/ranked grassland	0.04	Negligible
V1_198	Japanese cedar hedgerow	0.07	Negligible
V1_199	Poplar treeland/exotic scrub/ranked grassland	0.09	Negligible
V1_200	Gorse shrubland	0.16	Negligible
V1_201	Macrocarpa/mixed native and exotic scrub/ranked grassland	0.02	Negligible
V1_203	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.15	Negligible
V1_204	River she-oak hedgerow	0.32	Negligible
V1_205	Ornamental plantings and gardens	0.15	Negligible
V1_206	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.18	Negligible

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V1_207	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.33	Negligible
V1_208	Gorse shrubland	0.03	Negligible
V1_209	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.03	Negligible
V1_212	Anthropic tōtara forest	0.10	Low
V1_213	Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland	0.25	Low
V1_214	Kahikatea-kauri-totara treeland	1.61	Very High
V1_215	Kānuka treeland/native and exotic scrub/ranked grassland	0.58	Low
V1_216	Anthropic tōtara forest	0.25	Low
V1_217	Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland	0.69	Low
V1_218	Kānuka treeland/native and exotic scrub/ranked grassland	0.72	Low
V1_219	Kauri-podocarp forest	2.82	Very High
V1_220	Broadleaved species scrub forest	0.12	Low
V1_221	Kānuka forest	0.12	Low
V1_222	Anthropic tōtara forest	1.41	Low
V1_223	Anthropic tōtara forest	0.08	Negligible
V1_224	Anthropic tōtara forest	0.63	Low
V1_225	Poplar treeland/exotic scrub/ranked grassland	0.07	Negligible
V1_226	Kohekohe-taraire-tawa-podocarp/broadleaf	5.45	Very High
V1_227	Kauri-podocarp forest	4.92	Very High
V1_228	Kauri-podocarp forest	2.30	Very High
V1_229	Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland	1.21	Moderate
V1_230	Anthropic tōtara forest	1.70	Low
V1_231	Kānuka forest	7.25	Very High
V1_232	Anthropic tōtara forest	0.05	Low
V1_235	Anthropic tōtara forest	1.29	Low
V1_236	Kānuka treeland/native and exotic scrub/ranked grassland	0.15	Low
V1_237	Planted native vegetation	0.47	Negligible
V1_238	Planted native vegetation	0.31	Negligible
V2_1	Kānuka forest	0.76	High
V2_2	Kānuka forest	0.26	Moderate
V2_3	Broadleaved species scrub forest	8.33	High
V2_4	Kohekohe-taraire-tawa-podocarp/broadleaf	2.15	Very High
V2_5	Exotic pine forest/mixed native and exotic scrub/ranked grassland	2.88	Low
V2_6	Planted native vegetation	1.59	Negligible
V2_7	Kohekohe-taraire-tawa-podocarp/broadleaf	0.97	High
V2_8	Kānuka forest	0.25	High
V2_9	Planted native vegetation	0.03	Negligible
V2_12	Broadleaved species scrub forest	5.14	Moderate
V2_13	Exotic pine forest/mixed native and exotic scrub/ranked grassland	145.74	Negligible
V2_16	Broadleaved species scrub forest	0.14	Low
V2_17	Broadleaved species scrub forest	0.51	Low
V2_18	Exotic pine forest/mixed native and exotic scrub/ranked grassland	39.41	Low
V2_19	Broadleaved species scrub forest	2.66	Moderate
V2_20	Broadleaved species scrub forest	3.61	Moderate
V2_21	Broadleaved species scrub forest	0.15	Low

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V2_22	Kohekohe-taraire-tawa-podocarp/broadleaf	0.13	Moderate
V2_23	Broadleaved species scrub forest	0.86	Low
V2_24	Broadleaved species scrub forest	1.14	Moderate
V2_26	Exotic pine forest/mixed native and exotic scrub/ranked grassland	23.52	Negligible
V2_27	Broadleaved species scrub forest	1.24	High
V2_32	Broadleaved species scrub forest	0.48	Low
V2_33	Broadleaved species scrub forest	1.02	Moderate
V2_34	Exotic pine forest/mixed native and exotic scrub/ranked grassland	19.08	Low
V2_35	Kohekohe-taraire-tawa-podocarp/broadleaf	17.06	Very High
V2_37	Kohekohe-taraire-tawa-podocarp/broadleaf	2.83	High
V2_39	Kohekohe-taraire-tawa-podocarp/broadleaf	19.21	Very High
V2_40	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.89	Negligible
V2_41	Kānuka forest	0.45	High
V2_42	Kānuka forest	3.00	High
V2_43	Kānuka forest	0.65	High
V2_44	Broadleaved species scrub forest	0.25	Moderate
V3_1	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.13	Negligible
V3_2	Ornamental plantings and gardens	0.54	Negligible
V3_3	Ornamental plantings and gardens	0.49	Negligible
V3_4	Ornamental plantings and gardens	0.07	Negligible
V3_5	Ornamental plantings and gardens	0.71	Negligible
V3_6	Exotic pine forest/mixed native and exotic scrub/ranked grassland	19.40	Negligible
V3_7	Anthropic tōtara forest	0.21	Low
V3_8	Anthropic tōtara forest	0.15	Low
V3_9	Anthropic tōtara forest	0.39	Low
V3_10	Poplar treeland/exotic scrub/ranked grassland	0.18	Negligible
V3_11	Anthropic tōtara forest	0.04	Low
V3_12	Mixed tall exotic shelterbelt treeland	0.23	Negligible
V3_13	Anthropic tōtara forest	0.18	Low
V3_14	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.07	Negligible
V3_15	Kauri-podocarp forest	11.74	Very High
V3_16	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.22	Negligible
V3_17	Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland	0.13	Low
V3_18	Kānuka forest	0.91	Low
V3_19	Anthropic tōtara forest	2.18	Low
V3_20	Anthropic tōtara forest	0.07	Low
V3_21	Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland	1.43	Low
V3_22	Anthropic tōtara forest	0.22	Low
V3_23	Macrocarpa/mixed native and exotic scrub/ranked grassland	0.18	Negligible
V3_24	Gorse shrubland	0.08	Negligible
V3_25	Kānuka treeland/native and exotic scrub/ranked grassland	0.24	Low
V3_26	Macrocarpa/mixed native and exotic scrub/ranked grassland	0.06	Negligible
V3_27	Tōtara-kauri/broadleaf scrub	1.87	High
V3_28	Anthropic tōtara forest	0.17	Low

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V3_29	Tōtara-kauri/broadleaf scrub	0.43	High
V3_30	Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland	1.26	Moderate
V3_31	Anthropic tōtara forest	0.07	Low
V3_32	Exotic pine forest/native broadleaf scrub	0.10	Low
V3_33	Anthropic tōtara forest	0.40	Low
V3_34	Exotic pine forest/native broadleaf scrub	0.28	Low
V3_36	Kahikatea treeland	0.12	Moderate
V3_37	Planted native vegetation	0.05	Negligible
V3_38	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.55	Negligible
V3_39	Tōtara-kauri/broadleaf scrub	1.32	High
V3_40	Broadleaved species scrub forest	0.53	Low
V3_41	Crack willow/mixed exotic and native shrub/exotic groundcover	0.22	Negligible
V3_42	Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland	0.28	Low
V3_44	Planted native vegetation	0.13	Negligible
V3_45	Nīkau treeland	0.07	Low
V3_46	Kānuka forest	0.01	Moderate
V3_47	Poplar treeland/exotic scrub/ranked grassland	0.05	Negligible
V3_48	Anthropic tōtara forest	0.05	Moderate
V3_49	Poplar treeland/exotic scrub/ranked grassland	0.17	Negligible
V3_50	Poplar treeland/exotic scrub/ranked grassland	0.12	Negligible
V3_51	Poplar treeland/exotic scrub/ranked grassland	0.02	Negligible
V3_52	Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland	2.37	Low
V3_53	Anthropic tōtara forest	0.91	Low
V3_54	Crack willow/mixed exotic and native shrub/exotic groundcover	0.03	Negligible
V3_55	Poplar treeland/exotic scrub/ranked grassland	0.17	Negligible
V3_56	Macrocarpa/mixed native and exotic scrub/ranked grassland	0.07	Negligible
V3_57	Kānuka treeland/native and exotic scrub/ranked grassland	0.07	Low
V3_58	Crack willow/mixed exotic and native shrub/exotic groundcover	0.30	Negligible
V3_59	Ornamental plantings and gardens	0.27	Negligible
V3_60	Anthropic tōtara forest	0.14	Low
V3_61	Mixed tall exotic shelterbelt treeland	0.28	Negligible
V3_62	Anthropic tōtara forest	0.15	Low
V3_63	Mixed exotic-native scrub and hedgerow scrub	0.19	Low
V3_64	Anthropic tōtara forest	0.05	Low
V3_65	Mixed tall exotic shelterbelt treeland	0.33	Negligible
V3_66	Mixed exotic-native scrub and hedgerow scrub	0.16	Negligible
V3_67	Anthropic tōtara forest	0.04	Low
V3_68	Crack willow/mixed exotic and native shrub/exotic groundcover	0.34	Negligible
V3_69	Ornamental plantings and gardens	0.04	Low
V3_70	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.07	Negligible
V3_71	Crack willow/mixed exotic and native shrub/exotic groundcover	0.41	Negligible
V3_72	Crack willow/mixed exotic and native shrub/exotic groundcover	0.11	Negligible
V3_73	Kahikatea treeland	0.17	Moderate
V4_1	Mixed tall exotic shelterbelt treeland	0.65	Negligible

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V4_2	Poplar treeland/exotic scrub/ranked grassland	1.09	Negligible
V4_3	Crack willow/mixed exotic and native shrub/exotic groundcover	1.69	Negligible
V4_4	Crack willow/mixed exotic and native shrub/exotic groundcover	0.69	Negligible
V4_5	Poplar treeland/exotic scrub/ranked grassland	0.69	Negligible
V4_6	Poplar treeland/exotic scrub/ranked grassland	0.07	Negligible
V4_7	Crack willow/mixed exotic and native shrub/exotic groundcover	1.36	Negligible
V4_8	Kānuka treeland/native and exotic scrub/ranked grassland	0.24	Low
V4_9	Tōtara forest/native broadleaf scrub	0.11	Low
V4_10	Mixed exotic-native scrub and hedgerow scrub	0.08	Low
V4_11	Ornamental plantings and gardens	0.08	Negligible
V4_12	Japanese cedar hedgerow	0.06	Negligible
V4_13	Crack willow/mixed exotic and native shrub/exotic groundcover	1.36	Negligible
V4_14	Crack willow/mixed exotic and native shrub/exotic groundcover	1.07	Negligible
V4_15	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.67	Negligible
V4_16	Broadleaved species scrub forest	0.54	Low
V4_17	Crack willow/mixed exotic and native shrub/exotic groundcover	0.19	Negligible
V4_18	Poplar treeland/exotic scrub/ranked grassland	0.12	Negligible
V4_19	Anthropic tōtara forest	0.16	Low
V4_20	Crack willow/mixed exotic and native shrub/exotic groundcover	0.15	Negligible
V4_21	Anthropic tōtara forest	0.13	Low
V4_22	Crack willow/mixed exotic and native shrub/exotic groundcover	0.83	Negligible
V4_23	Anthropic tōtara forest	0.24	Low
V4_24	Tōtara-kānuka forest/mixed native and exotic scrub/ranked grassland	0.33	Low
V4_25	Anthropic tōtara forest	0.14	Low
V4_26	Crack willow/mixed exotic and native shrub/exotic groundcover	0.51	Negligible
V4_27	Pūriri forest/ranked grassland	0.12	Low
V4_28	Anthropic tōtara forest	0.20	Low
V4_30	Crack willow/mixed exotic and native shrub/exotic groundcover	0.89	Negligible
V4_31	Crack willow/mixed exotic and native shrub/exotic groundcover	0.72	Negligible
V4_32	Crack willow/mixed exotic and native shrub/exotic groundcover	0.35	Negligible
V4_33	Poplar treeland/exotic scrub/ranked grassland	0.02	Negligible
V4_34	Crack willow/mixed exotic and native shrub/exotic groundcover	0.33	Negligible
V4_35	Poplar treeland/exotic scrub/ranked grassland	0.01	Negligible
V4_36	Poplar treeland/exotic scrub/ranked grassland	0.09	Negligible
V4_37	Poplar treeland/exotic scrub/ranked grassland	0.07	Negligible
V4_38	Pūriri forest/ranked grassland	0.93	Moderate
V4_39	Crack willow/mixed exotic and native shrub/exotic groundcover	0.19	Negligible
V4_40	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.49	Negligible
V4_41	Planted native vegetation	2.08	Negligible
V4_42	Pūriri forest/ranked grassland	0.19	Moderate
V4_43	Pūriri forest/ranked grassland	0.11	Moderate
V4_44	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.08	Negligible
V4_45	Crack willow/mixed exotic and native shrub/exotic groundcover	1.10	Low
V4_46	Pūriri forest/ranked grassland	0.35	Low
V4_47	Kānuka treeland/native and exotic scrub/ranked grassland	0.25	Low

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V4_48	Kānuka treeland/native and exotic scrub/ranked grassland	1.17	Moderate
V4_49	Crack willow/mixed exotic and native shrub/exotic groundcover	0.08	Negligible
V4_50	Kānuka treeland/native and exotic scrub/ranked grassland	0.09	Low
V4_51	Crack willow/mixed exotic and native shrub/exotic groundcover	0.12	Negligible
V4_52	Crack willow/mixed exotic and native shrub/exotic groundcover	0.20	Negligible
V4_53	Kānuka treeland/native and exotic scrub/ranked grassland	1.15	Moderate
V4_54	Macrocarpa/mixed native and exotic scrub/ranked grassland	0.21	Negligible
V4_55	Kānuka treeland/native and exotic scrub/ranked grassland	0.21	Low
V4_56	Mixed tall exotic shelterbelt treeland	0.17	Negligible
V4_57	Kānuka forest	7.50	Very High
V4_58	Anthropic tōtara forest	0.13	Low
V4_59	Kauri-podocarp forest	0.08	High
V4_60	Anthropic tōtara forest	0.91	Moderate
V4_61	Kānuka forest	0.43	Very High
V4_62	Kānuka forest	6.04	Very High
V4_63	Kauri-podocarp forest	1.65	Very High
V4_64	Kānuka forest	17.00	Very High
V4_65	Kānuka treeland/native and exotic scrub/ranked grassland	0.87	Low
V4_66	Kānuka forest	13.52	Very High
V4_67	Crack willow/mixed exotic and native shrub/exotic groundcover	0.02	Negligible
V4_68	Kānuka forest	0.03	Very High
V4_69	Kānuka treeland/native and exotic scrub/ranked grassland	0.17	Low
V4_70	Kānuka treeland/native and exotic scrub/ranked grassland	0.06	Low
V4_72	Kānuka forest	0.04	Very High
V4_73	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.06	Negligible
V4_74	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.12	Negligible
V4_76	Lawson's cypress-exotic pine treeland	0.66	Low
V4_77	Lawson's cypress-exotic pine treeland	0.29	Low
V4_79	Kānuka treeland/native and exotic scrub/ranked grassland	0.04	Low
V4_81	Kānuka treeland/native and exotic scrub/ranked grassland	0.06	Low
V4_82	Anthropic tōtara forest	0.17	Low
V4_84	Poplar treeland/exotic scrub/ranked grassland	0.03	Negligible
V4_85	Kānuka forest	0.09	Low
V4_86	Poplar treeland/exotic scrub/ranked grassland	0.14	Negligible
V4_87	Kānuka treeland/native and exotic scrub/ranked grassland	0.06	Low
V4_88	Exotic pine forest/native broadleaf scrub	0.02	Negligible
V4_89	Crack willow/mixed exotic and native shrub/exotic groundcover	0.36	Negligible
V4_90	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.27	Negligible
V4_91	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.11	Negligible
V4_95	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.34	Negligible
V4_96	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.95	Negligible
V4_97	Poplar treeland/exotic scrub/ranked grassland	0.19	Negligible
V4_98	Eucalyptus treeland/ranked grassland	0.72	Negligible
V4_99	Crack willow/mixed exotic and native shrub/exotic groundcover	0.13	Negligible
V4_101	Poplar treeland/exotic scrub/ranked grassland	0.18	Negligible

Vegetation Identification Code	Vegetation Type	Area (ha)	Ecological Value
V4_103	Macrocarpa/mixed native and exotic scrub/ranked grassland	0.21	Negligible
V4_105	Tōtara-kauri/broadleaf scrub	0.34	High
V4_106	Ornamental plantings and gardens	0.28	Low
V4_107	Ornamental plantings and gardens	0.25	Low
V4_108	Mixed exotic-native scrub and hedgerow scrub	0.06	Low
V4_109	Crack willow-exotic trees-remnant native trees/mixed exotic and native shrub	0.14	Low
V4_110	Broadleaved species scrub forest	0.10	Low
V4_111	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.81	Negligible
V4_112	Kānuka forest	0.10	Very High
V4_113	Crack willow/mixed exotic and native shrub/exotic groundcover	0.13	Negligible
V4_114	Kauri-podocarp forest	0.95	Very High
V4_115	Macrocarpa/mixed native and exotic scrub/ranked grassland	0.24	Negligible
V4_116	Crack willow/mixed exotic and native shrub/exotic groundcover	0.38	Negligible
V4_117	Crack willow/mixed exotic and native shrub/exotic groundcover	0.06	Negligible
V4_118	Crack willow-exotic trees-remnant native trees/mixed exotic and native shrub	0.70	Moderate
V4_120	Poplar treeland/exotic scrub/ranked grassland	0.27	Negligible
V4_121	Kohekohe-taraire-tawa-podocarp/broadleaf	1.88	High
V4_122	Mixed exotic-native scrub and hedgerow scrub	0.13	Low
V4_123	Scattered podocarp-broadleaf-kanuka treeland/mixed native and exotic scrub/ranked grassland	0.03	Low
V4_124	Bamboo forest	0.08	Negligible
V4_125	Crack willow/mixed exotic and native shrub/exotic groundcover	0.25	Negligible
V4_126	Crack willow/mixed exotic and native shrub/exotic groundcover	0.48	Negligible
V4_127	Poplar treeland/exotic scrub/ranked grassland	0.17	Negligible
V4_128	Crack willow/mixed exotic and native shrub/exotic groundcover	0.16	Negligible
V4_129	Crack willow/mixed exotic and native shrub/exotic groundcover	0.04	Negligible
V4_130	Ornamental plantings and gardens	0.05	Low
V4_131	Exotic pine forest/mixed native and exotic scrub/ranked grassland	0.07	Negligible
V4_132	Crack willow/mixed exotic and native shrub/exotic groundcover	0.58	Negligible
V4_133	Crack willow/mixed exotic and native shrub/exotic groundcover	0.05	Negligible
V4_134	Ornamental plantings and gardens	0.37	Low
V4_136	Crack willow/mixed exotic and native shrub/exotic groundcover	0.04	Negligible

Appendix G
Plant species recorded during field surveys

Scientific name	Common name	Threat status
Muehlenbeckia complexa var. grandifolia	-	Threatened - Nationally Vulnerable
Agathis australis	Kauri	At Risk - Declining
Coprosma acerosa	Sand coprosma	At Risk - Declining
Leionema nudum	Mairehau	At Risk - Declining
Mida salicifolia	Maire taiki	At Risk - Declining
Carmichaelia australis	Common broom	At Risk - Declining
Doodia mollis	Mokimoki	At Risk - Naturally Uncommon
Doodia squarrosa	-	At Risk - Naturally Uncommon
Hypolepis dicksonioides	Giant hypolepis	At Risk - Naturally Uncommon
Meryta sinclairii	Puka	At Risk - Naturally Uncommon
Acianthus sinclairii	Pixie cap	Not Threatened
Adiantum aethiopicum	makaka	Not Threatened
Adiantum hispidulum	Rosy maidenhair	Not Threatened
Alectryon excelsus subsp. excelsus	Tītoki	Not Threatened
Alseuosmia banksii var. banksii	-	Not Threatened
Alseuosmia banksii var. linariifolia	-	Not Threatened
Alseuosmia macrophylla	Toropapa	Not Threatened
Alseuosmia quercifolia	Oak-leaved toropapa	Not Threatened
Alsophila cunninghamii	Slender tree fern	Not Threatened
Alsophila dealbata	Silver fern	Not Threatened
Apodasmia similis	Jointed wire rush	Not Threatened
Aristotelia serrata	Makomako	Not Threatened
Asplenium bulbiferum	Hen and chicken fern	Not Threatened
Asplenium flaccidum	Drooping spleenwort	Not Threatened
Asplenium lamprophyllum	-	Not Threatened
Asplenium oblongifolium	Shining spleenwort	Not Threatened
Asplenium polyodon	Sickle spleenwort	Not Threatened
Astelia hastata	Tank lily	Not Threatened
Astelia solandri	Perching lily	Not Threatened
Austroblechnum membranaceum	-	Not Threatened
Beilschmiedia tarairi	Taraire	Not Threatened
Beilschmiedia tawa	Tawa	Not Threatened
Brachyglottis repanda	Rangiora	Not Threatened
Bulbophyllum pygmaeum	Pygmy tree orchid	Not Threatened
Carex dissita	Forest sedge	Not Threatened
Carex secta	Purei	Not Threatened

Scientific name	Common name	Threat status
Carpodetus serratus	Marbleleaf	Not Threatened
Centella uniflora	Centella	Not Threatened
Clematis foetida	-	Not Threatened
Clematis paniculata	Puawananga	Not Threatened
Coprosma arborea	Māmāngi	Not Threatened
Coprosma areolata	Thin-leaved coprosma	Not Threatened
Coprosma grandifolia	Kanono	Not Threatened
Coprosma lucida	Shining karamū	Not Threatened
Coprosma repens	Mirror coprosma	Not Threatened
Coprosma rhamnoides	Twiggy coprosma	Not Threatened
Coprosma rigida	-	Not Threatened
Coprosma robusta	Karamū	Not Threatened
Coprosma rotundifolia	-	Not Threatened
Coprosma spathulata subsp. spathulata	-	Not Threatened
Coprosma tenuicaulis	Swamp coprosma	Not Threatened
Coprosma x cunninghamii	-	Not Threatened
Coprosma x kirkii	-	Not Threatened
Cordyline australis	Cabbage tree	Not Threatened
Cordyline banksii	Forest cabbage tree	Not Threatened
Corokia x virgata	Korokio	Not Threatened
Corybas macranthus	Silver-back spider orchid	Not Threatened
Corynocarpus laevigatus	Karaka	Not Threatened
Cranfillia fluviatilis	Kiwakiwa	Not Threatened
Dacrycarpus dacrydioides	kahikatea	Not Threatened
Dacrydium cupressinum	Rimu	Not Threatened
Dendrobium cunninghamii	Winika	Not Threatened
Dendroconche scandens	Fragrant fern	Not Threatened
Deparia petersenii subsp. congrua	Japanese lady fern	Not Threatened
Dianella haematica	Swamp blueberry	Not Threatened
Dianella nigra	Turutu	Not Threatened
Dichondra repens	Dichondra	Not Threatened
Dicksonia squarrosa	Wheki	Not Threatened
Didymocheton spectabilis	Kohekohe	Not Threatened
Diplazium australe	Australe lady fern	Not Threatened
Diploblechnum fraseri	Miniature tree fern	Not Threatened
Doodia australis	Rasp fern	Not Threatened
Earina autumnalis	Easter orchid	Not Threatened
Earina mucronata	Bamboo orchid	Not Threatened
Elaeocarpus dentatus var. dentatus	Hīnau	Not Threatened

Scientific name	Common name	Threat status
Elatostema rugosum	Parataniwha	Not Threatened
Freycinetia branksii	Kiekie	Not Threatened
Fuchsia excorticata	Tree fuchsia	Not Threatened
Gahnia setifolia	Māpere	Not Threatened
Gahnia xanthocarpa	Māpere	Not Threatened
Geniostoma ligustrifolium	Hangehange	Not Threatened
Griselinia littoralis	Kāpuka	Not Threatened
Griselinia lucida	Akapuka	Not Threatened
Haloragis erecta subsp. erecta	Fire weed	Not Threatened
Hedycarya arborea	Pigeonwood	Not Threatened
Histiopteris incisa	Water fern	Not Threatened
Hiya distans	-	Not Threatened
Hymenophyllum demissum	Drooping filmy fern	Not Threatened
Hymenophyllum flabellatum	Filmy fern	Not Threatened
Hypolepis ambigua	-	Not Threatened
Icarus filiformis	Thread fern	Not Threatened
Isolepis cernua	Slender clubrush	Not Threatened
Juncus sarophorus	Broom rush	Not Threatened
Knightia excelsa	Rewarewa	Not Threatened
Kunzea robusta	Kānuka	Not Threatened
Lastreopsis hispida	Hairy fern	Not Threatened
Laurelia novae-zelandiae	Pukatea	Not Threatened
Leptopteris hymenophylloides	Crêpe	Not Threatened
Leucopogon fasciculatus	Tall mingimingi	Not Threatened
Libocedrus plumosa	Kawaka	Not Threatened
Lindsaea trichomanoides	-	Not Threatened
Lomaria discolor	Crown fern	Not Threatened
Lygodium articulatum	Mangemange	Not Threatened
Melicope simplex	Poataniwha	Not Threatened
Melicytus macrophyllus	Large-leaved māhoe	Not Threatened
Melicytus micranthus	Swamp māhoe	Not Threatened
Melicytus ramiflorus subsp. Ramiflorus	Māhoe	Not Threatened
Metrosideros fulgens	Climbing rātā	Not Threatened
Metrosideros perforata	Akatea	Not Threatened
Microtis unifolia	Onion-leaved orchid	Not Threatened
Muehlenbeckia australis	Pōhuehue	Not Threatened
Muehlenbeckia complexa	Pōhuehue	Not Threatened
Myoporum laetum	Ngaio	Not Threatened
Myrsine australis	Red matipo	Not Threatened

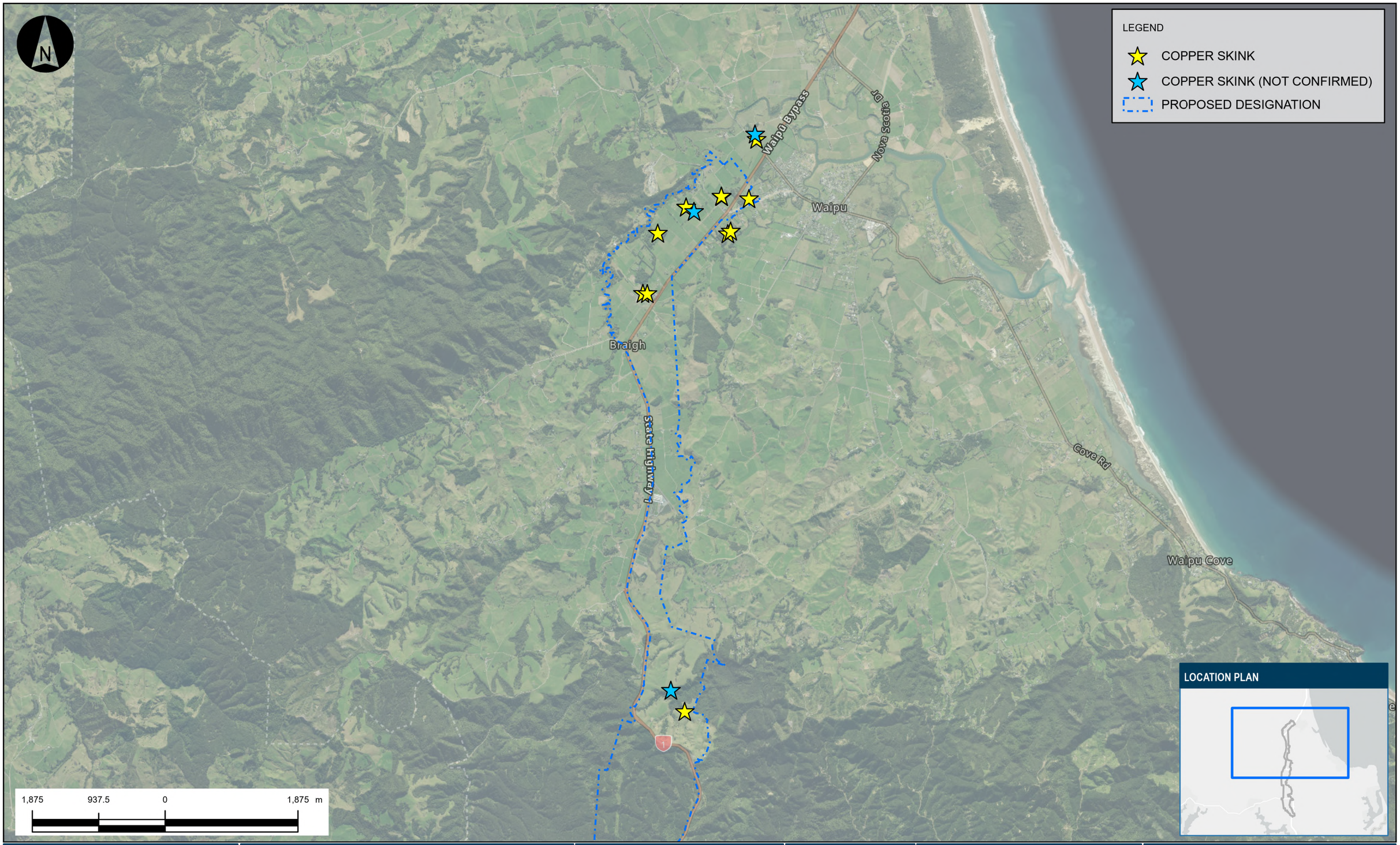
Scientific name	Common name	Threat status
Nertera depressa	Nertera	Not Threatened
Nertera dichondrifolia	-	Not Threatened
Notelaea neolanceolata	White maire	Not Threatened
Oplismenus hirtellus subsp. imbecillis	Basket grass	Not Threatened
Paesia scaberula	Lace fern	Not Threatened
Pakau pennigera	Gully fern	Not Threatened
Parablechnum novae-zelandiae	Kiokio	Not Threatened
Parapolystichum glabellum	Smooth shield fern	Not Threatened
Parapolystichum microsorum	-	Not Threatened
Paratrophis microphylla	Tūrepo	Not Threatened
Parsonsia heterophylla	New Zealand jasmine	Not Threatened
Passiflora tetranda	Kohia	Not Threatened
Pectinopitys ferruginea	Miro	Not Threatened
Pellaea rotundifolia	Round-leaved fern	Not Threatened
Phormium tenax	Harakeke	Not Threatened
Phyllocladus trichomanoides	Tanekaha	Not Threatened
Piper excelsum subsp. excelsum	Kawakawa	Not Threatened
Pittosporum crassifolium	Karo	Not Threatened
Pittosporum eugenioides	Tarata	Not Threatened
Pittosporum tenuifolium	Black matipo	Not Threatened
Plagianthus regius subsp. regius	Lowland ribbonwood	Not Threatened
Podocarpus laetus	Hall's tōtara	Not Threatened
Podocarpus totara var. totara	Tōtara	Not Threatened
Polyphlebium venosum	Veined bristlee fern	Not Threatened
Pomaderris kumeraho	Kumarahou	Not Threatened
Prumnopitys taxifolia	Matai	Not Threatened
Pseudodiphasium volubile	Climbing clubmoss	Not Threatened
Pseudopanax crassifolius	Lancewood	Not Threatened
Pteridium exculentum	Bracken	Not Threatened
Pteris macilenta	Sweet fern	Not Threatened
Pteris tremula	Shaking brake	Not Threatened
Pterophylla sylvicola	Towai	Not Threatened
Pterostylis agathicola	Kauri greenhood	Not Threatened
Pterostylis alobula	Greenhood	Not Threatened
Pyrrosia eleagnifolia	Leather-leaf fern	Not Threatened
Rhabdothamnus solandri	Taurepo	Not Threatened
Rhopalostylis sapida	Nikau	Not Threatened
Ripogonum scandens	Supplejack	Not Threatened
Rubus cissoides	Bush lawyer	Not Threatened
Schefflera digitata	Patatē	Not Threatened

Scientific name	Common name	Threat status
Shawia furfuracea	Akepiro	Not Threatened
Shawia rani	Heketara	Not Threatened
Sophora chathamica	Coastal kōwhai	Not Threatened
Sophora microphylla	small-leaved kōwhai	Not Threatened
Sphaeropteris medullaris	Mamaku	Not Threatened
Tmesipteris elongata	Fork fern	Not Threatened
Tmesipteris lanceolata	Fork fern	Not Threatened
Veronica diosmifolia	Hebe	Not Threatened
Veronica topiaria	Hebe	Not Threatened
Vitex lucens	Pūriri	Not Threatened
Zealandia pustulata subsp. Pustulata	Hound’s tongue	Not Threatened
Leptospermum scoparium	Mānuka	Not Threatened
Veronica macrocarpa var. macrocarpa	Hebe	Not Threatened
Agapanthus praecox subsp. Orientalis	Agapanthus	Environmental Weed (2024)
Ageratina adenophora	Mexican devil	Environmental Weed (2024)
Allium triquetrum	Onion weed	Environmental Weed (2024)
Anredera cordifolia	Madeira vine	Environmental Weed (2024)
Araujia hortorum	Moth plant	Environmental Weed (2024)
Archontophoenix cunninghamiana	Bangalow palm	Environmental Weed (2024)
Asparagus scandens	Climbing asparagus	Environmental Weed (2024)
Bellis perennis	English daisy	Environmental Weed (2024)
Berberis glaucocarpa	Barberry	Environmental Weed (2024)
Canna indica	Indian shot	Environmental Weed (2024)
Cenchrus clandestinus	Kikuyu	Environmental Weed (2024)
Chlorophytum comosum	Spider plant	Environmental Weed (2024)
Cirsium vulgare	Scotch thisle	Environmental Weed (2024)
Cortaderia sp.	Pampas	Environmental Weed (2024)
Cotoneaster glaucophyllus	Large-leaved cotoneaster	Environmental Weed (2024)
Crataegus monogyna	Hawthorn	Environmental Weed (2024)
Crocosmia ×crocosmiiflora	Montbretia	Environmental Weed (2024)
Dactylis glomerata	Cocksfoot	Environmental Weed (2024)
Delairea odorata	German ivy	Environmental Weed (2024)
Digitalis purpurea	Fox glove	Environmental Weed (2024)
Ehrharta erecta	Veldt grass	Environmental Weed (2024)
Elaeagnus ×reflexa	Elaeagnus	Environmental Weed (2024)
Euonymus japonicus	Japanese spindleberry	Environmental Weed (2024)
Hedera helix	English ivy	Environmental Weed (2024)
Hedychium spp.	Ginger	Environmental Weed (2024)
Helosciadium nodiflorum	Fool's watercress	Environmental Weed (2024)

Scientific name	Common name	Threat status
Hesperocyparis macrocarpa	Macrocarpa	Environmental Weed (2024)
Holcus lanatus	Yorkshire fog	Environmental Weed (2024)
Hydrangea macrophylla	Hydrangea	Environmental Weed (2024)
Hypericum androsaemum	Tutsan	Environmental Weed (2024)
Impatiens sodenii	Sod's balsam	Environmental Weed (2024)
Jacobaea vulgaris	Ragwort	Environmental Weed (2024)
Jasminum polyanthum	Pink jasmine	Environmental Weed (2024)
Ligustrum lucidum	Tree privet	Environmental Weed (2024)
Ligustrum sinense	Chinese privet	Environmental Weed (2024)
Lolium perenne	Rye grass	Environmental Weed (2024)
Lonicera japonia	Japanese honeysuckle	Environmental Weed (2024)
Mrassula multicava subsp. multicava	Fairy crassula	Environmental Weed (2024)
Nephrolepis cordifolia	Ladder fern	Environmental Weed (2024)
Olea europaea	Olive	Environmental Weed (2024)
Paraserianthes lophantha	Brush wattle	Environmental Weed (2024)
Pinus radiata	Pine	Environmental Weed (2024)
Poa annua	Annual poa	Environmental Weed (2024)
Prunus sp.	Cherry	Environmental Weed (2024)
Quercus robur	Oak	Environmental Weed (2024)
Roldana petasitis	Velvet groundsel	Environmental Weed (2024)
Salix fragilis × S. euxina	Crack willow	Environmental Weed (2024)
Solanum mauritianum	Woolly nightshade	Environmental Weed (2024)
Solanum pseudocapsicum	Jerusalem cherry	Environmental Weed (2024)
Syzygium smithii	Lilly pilly	Environmental Weed (2024)
Thuunbergia alata	Black-eyed susan	Environmental Weed (2024)
Tradescantia fluminensis	Wandering willie	Environmental Weed (2024)
Ulex europaeus	Gorse	Environmental Weed (2024)
Vinca major	Periwinkle	Environmental Weed (2024)
Zantedeschia aethiopica	Arum lily	Environmental Weed (2024)
Acacia sp.	Acacia	Exotic
Alnus cordata	Italian alder	Exotic
Anthoxanthum odoratum	Sweet vernal grass	Exotic
Araucaria heterophylla	Norfolk Island pine	Exotic
Begonia spp.	Begonia	Exotic
Callianthe picta	-	Exotic
Camellia spp.	Camellia	Exotic
Cardamine hirsuta	Bittercress	Exotic
Casuarina cunninghamiana	She oak	Exotic
Chamaecyparis lawsoniana	Lawson’s cypress	Exotic
Clivia miniata	Clivia	Exotic

Scientific name	Common name	Threat status
Cryptomeria japonica	Japanese sugi	Exotic
Eucalyptus sp.	Eucalyptus	Exotic
Freesia laxa	False freesia	Exotic
Gallium aparine	Cleavers	Exotic
Geranium robertianum	Herb Robert	Exotic
Hyacinthoides hispanica	Spanish bluebell	Exotic
Ligularia reniformis	Tractor seat plant	Exotic
Lotus pedunculatus	Lotus	Exotic
Macadamia integrifolia	Macadamia	Exotic
Macrozamia communis	Burrawang	Exotic
Magnolia grandiflora	Southern magnolia	Exotic
Melaleuca sp.	Bottlebrush	Exotic
Metrosideros collina	Metrosideros Tahiti	Exotic
Neoregelia spp.	Bromeliads	Exotic
Pericallis webbii	-	Exotic
Philodendron spp.	Philodendron	Exotic
Phyllostachys sp.	Bamboo	Exotic
Plantago lanceolata	Naroow-leaved plantain	Exotic
Populus spp.	Poplar	Exotic
Potentilla indica	Indian strawberry	Exotic
Prunella vulgaris	Self heal	Exotic
Ranunculus repens	Creeping buttercup	Exotic
Rosa spp.	Rose	Exotic
Rubus fruticosus agg.	Blackberry	Exotic
Rumex obtusifolius	Broad-leaved dock	Exotic
Sequoia sempervirens	Redwood	Exotic
Sporobolus africanus	Rat's tail	Exotic
Stachys sylvatica	Hedge woundwort	Exotic
Syagrus romanzoffiana	Queen palm	Exotic
Trifolium repens	White clover	Exotic

Appendix H
Lizard Observation Survey Results



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	10/12/2025	FOR INFORMATION	RDP
	B	10/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:50,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	J. SCHRIVERSHOF	31/03/2026
REVIEWED	M. YUNGNICKEL	31/03/2026
VERIFIED	M. YUNGNICKEL	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

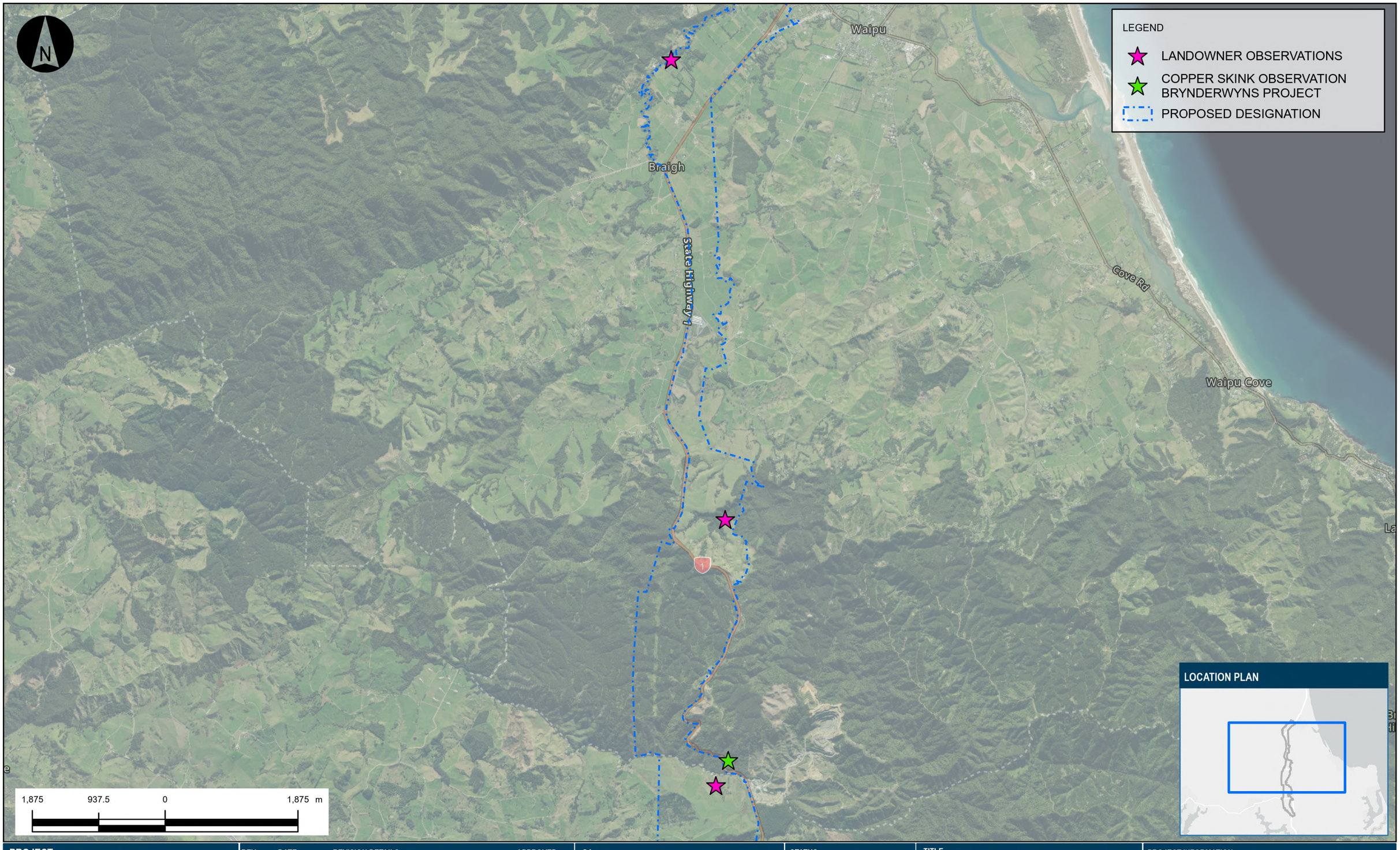
BRYNDERWYN HILLS SECTION NATURAL LIZARD OBSERVATIONS PROJECT SURVEY RESULTS

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1150			
SCALE	SIZE	REFERENCE NO.	REV
1:50,000	A3	PE-1150	C

Appendix I
Lizard Observation Desktop Results



PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:50,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	10/12/2025	FOR INFORMATION	RDP
B	10/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	J. SCHRIVERSHOF	31/03/2026
REVIEWED	M. YUNGNICKEL	31/03/2026
VERIFIED	M. YUNGNICKEL	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
NATURAL LIZARD OBSERVATIONS
DESKTOP RESULTS

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1151

SCALE	SIZE	REFERENCE NO.	REV
1:50,000	A3	PE-1151	C

Appendix J
Frog Survey results

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	10/12/2025	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:100,000				
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	M. MADSEN	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION FROG DENSITY OVERVIEW MAP

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1155			
SCALE	SIZE	REFERENCE NO.	REV
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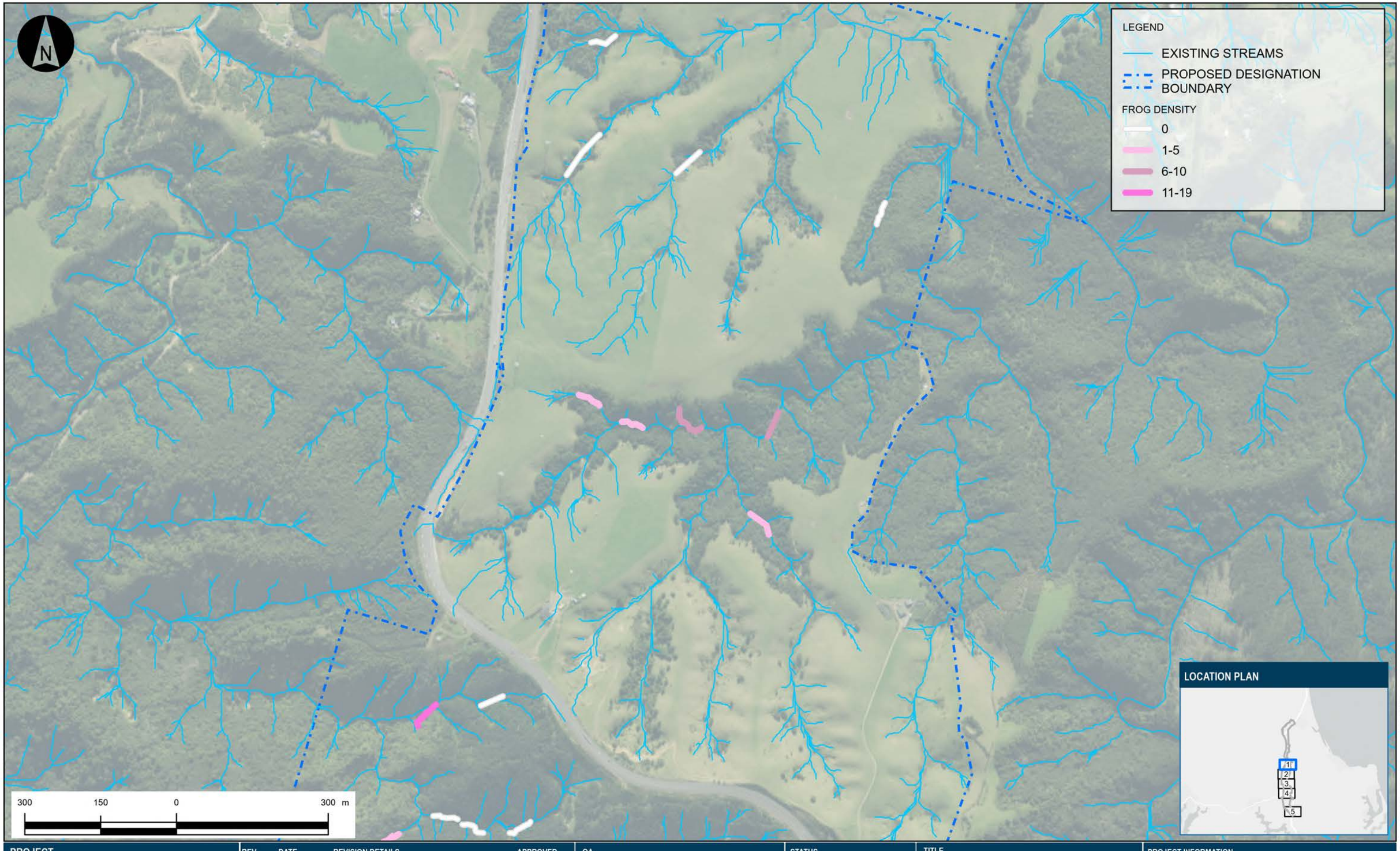

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	19/12/2025	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	M. MADSEN	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
FROG DENSITY MAP
SHEET 1 OF 5

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1156			
SCALE	SIZE	REFERENCE NO.	REV
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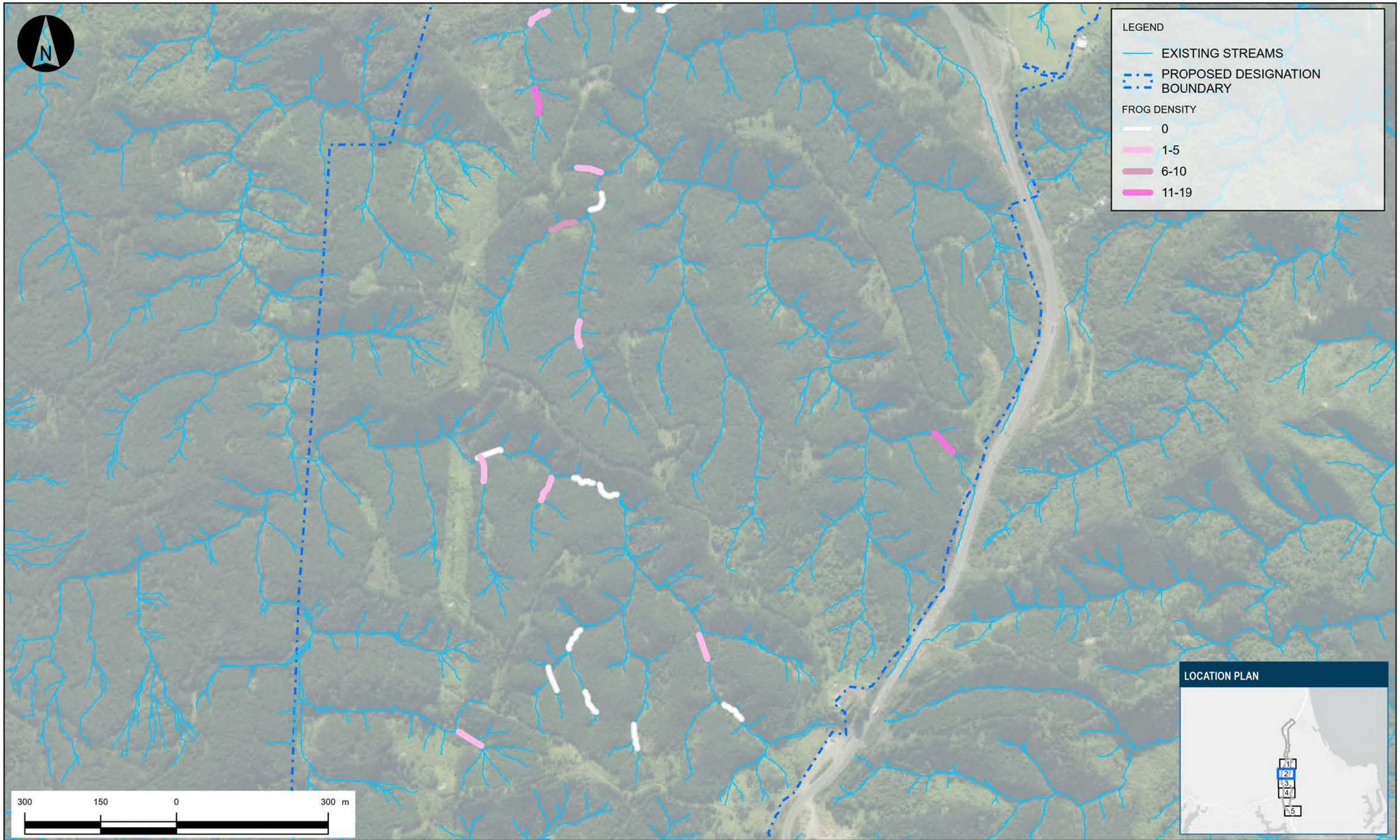

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	19/12/2025	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000				
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	M. MADSEN	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
FROG DENSITY MAP
SHEET 2 OF 5

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1157

SCALE	SIZE	REFERENCE NO.	REV
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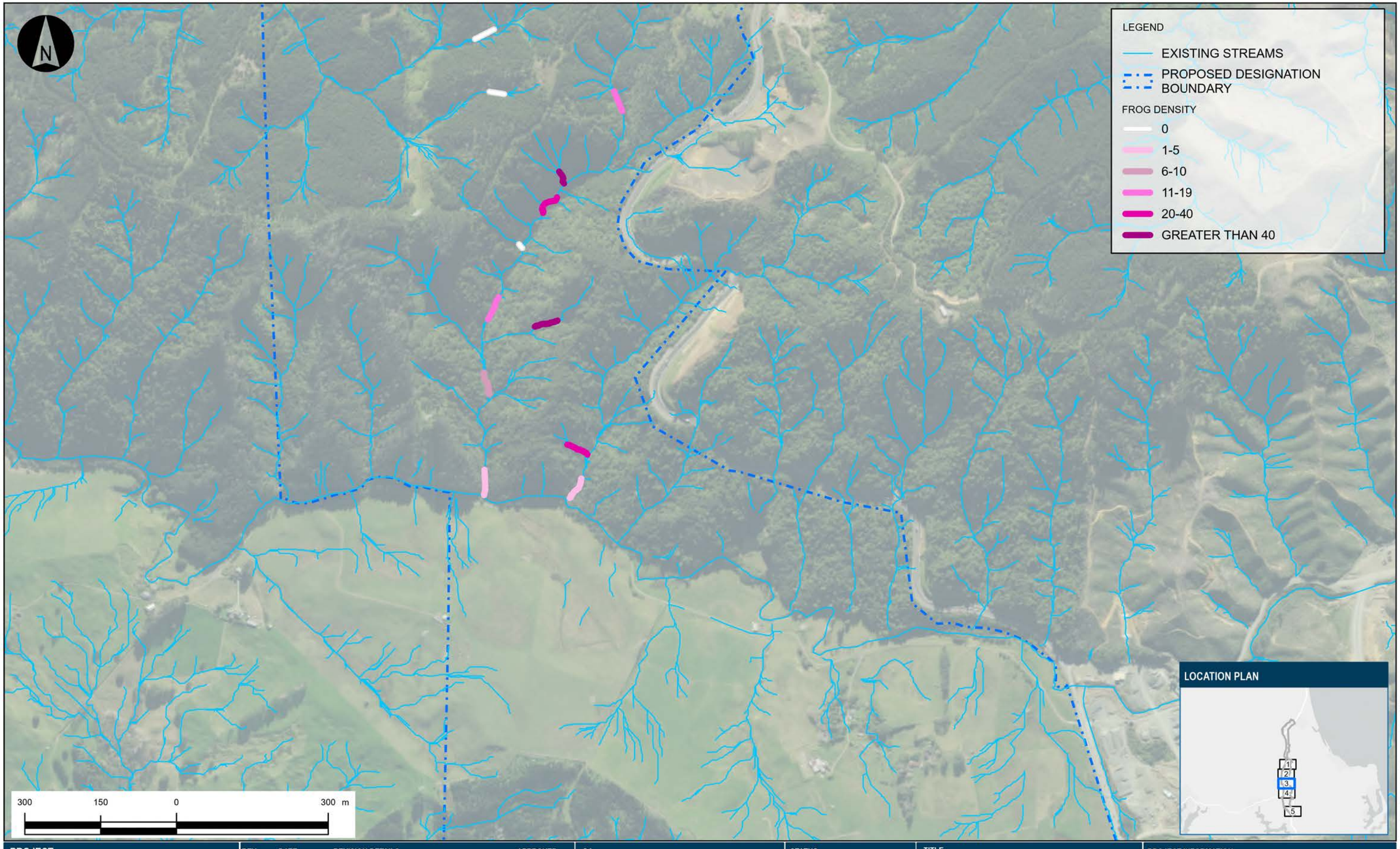

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	19/12/2025	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000				
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	M. MADSEN	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
FROG DENSITY MAP
SHEET 3 OF 5

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1158

SCALE	SIZE	REFERENCE NO.	REV
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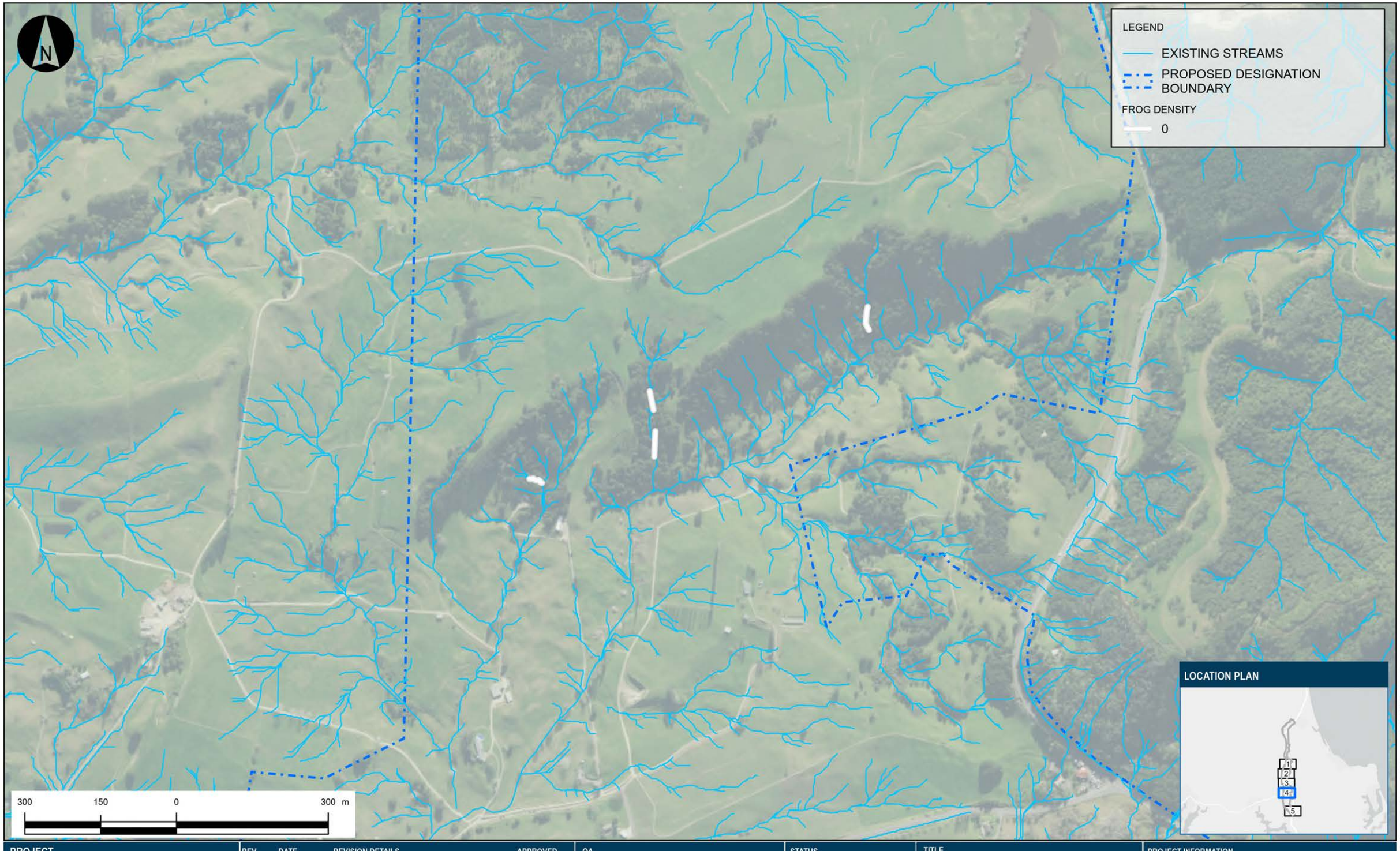

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	19/12/2025	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	M. MADSEN	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED: R. DU PLOOY

APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION FROG DENSITY MAP SHEET 4 OF 5

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: **10722-PTA-2B0-PE-DRG-1159**

SCALE	SIZE	REFERENCE NO.	REV
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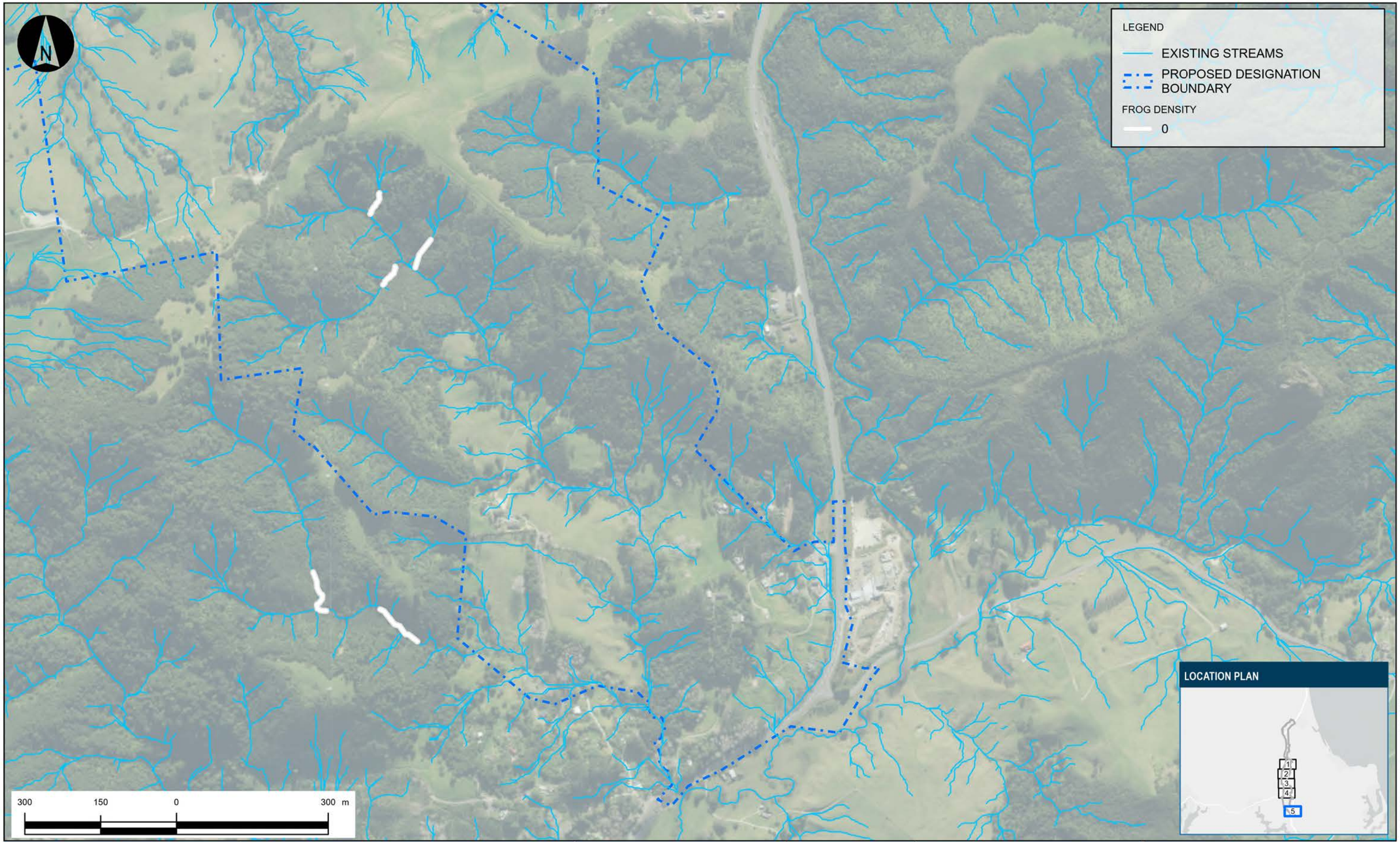


PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	19/12/2025	FOR INFORMATION	RDP
B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	M. MADSEN	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
FROG DENSITY MAP
SHEET 5 OF 5

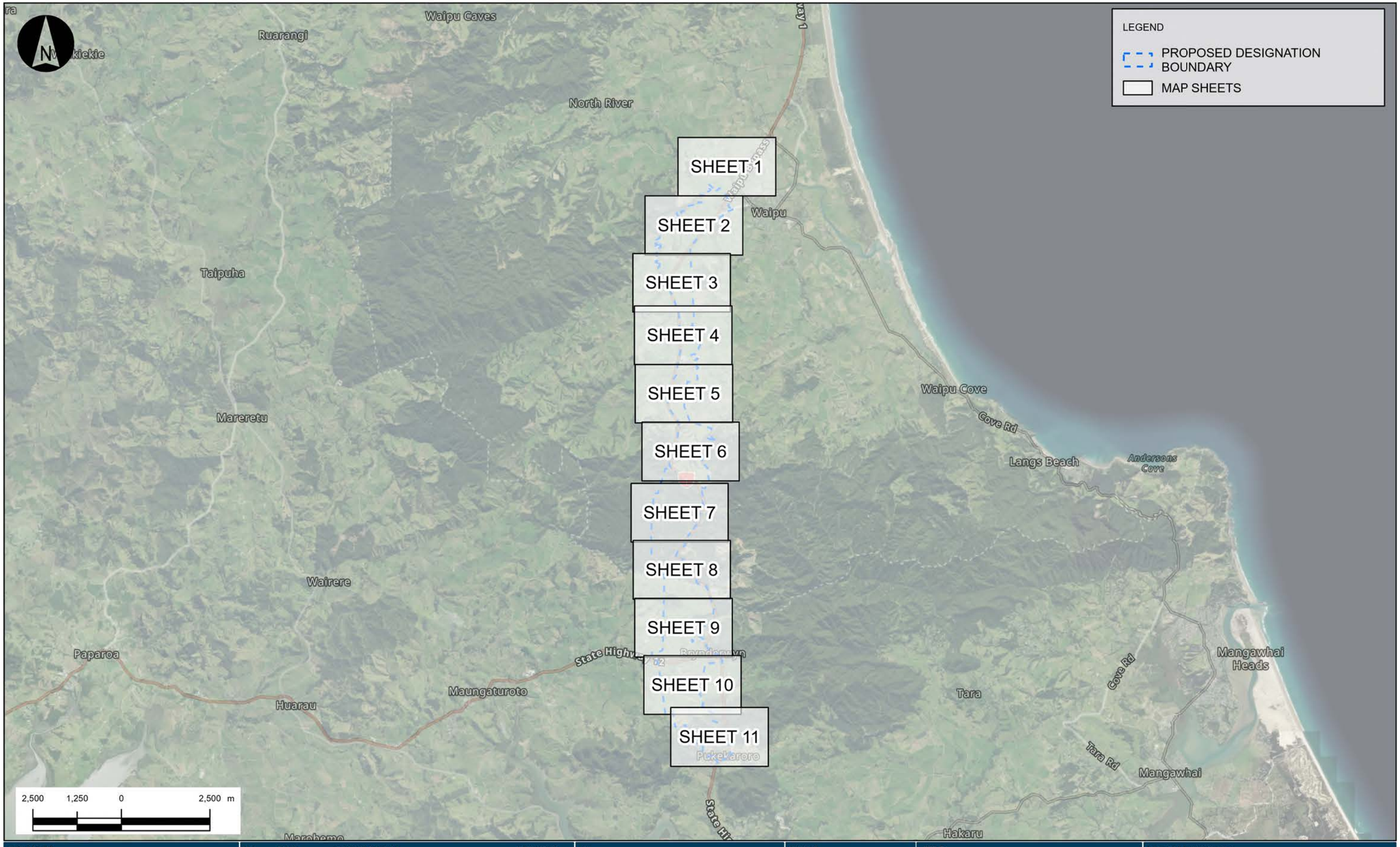
PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1160			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1160	C

Appendix K
Summary of bat data recorded at each site

Site #	Survey 1 (September - November 2025)			Survey 2 (January - February 2026)		
	Total passes	Valid nights	Average passes/night	Total passes	Valid nights	Average passes/night
1*	0	42	0.00	0	10	0.00
2	0	42	0.00	0	21	0.00
3	0	42	0.00	0	14	0.00
4	0	42	0.00	0	21	0.00
5	0	42	0.00	0	21	0.00
6	0	42	0.00	0	21	0.00
7	0	42	0.00	0	21	0.00
8	0	28	0.00	Fail		
9	0	41	0.00	0	21	0.00
10	0	41	0.00	0	7	0.00
11*	0	41	0.00	0	21	0.00
12*	0	41	0.00	0	21	0.00
13	0	30	0.00	Fail		
14*	0	41	0.00	0	21	0.00
15*	0	40	0.00	0	21	0.00
16*	0	41	0.00	0	21	0.00
17	0	42	0.00	Fail		
18	1	32	0.03	0	20	0.00
19	0	42	0.00	2	20	0.10
20	0	29	0.00	0	20	0.00
21	1	40	0.03	0	20	0.00
22	2	40	0.05	0	20	0.00
23	1	41	0.02	0	20	0.00
24	1	41	0.02	2	20	0.10
25	2	41	0.05	1	18	0.06
26	2	41	0.05	0	20	0.00
27	0	39	0.00	0	20	0.00
28	0	32	0.00	0	20	0.00
29	0	38	0.00	1	20	0.05
30	1	38	0.03	0	20	0.00
31	2	23	0.09	0	20	0.00
32	11	39	0.28	3	20	0.15
33	27	40	0.68	2	20	0.10
34	33	46	0.72	-	-	-
35	20	32	0.63	-	-	-
36	1	32	0.03	-	-	-
37	0	23	0.00	-	-	-
38	0	41	0.00	0	20	0.00
39	0	29	0.00	2	20	0.10
40	0	26	0.00	1	20	0.05
41	0	19	0.00	0	20	0.00
42	0	41	0.00	0	20	0.00
43*	1	41	0.02	2	20	0.10
44*	0	41	0.00	0	14	0.00
45	0	32	0.00	0	13	0.00
46	0	32	0.00	0	19	0.00
47	0	32	0.00	Fail		
48*	0	26	0.00	0	21	0.00
Total	106	-	0.06 (± 0.2 SD)	16	-	0.02 (± 0.04 SD)

*Sites outside of the Proposed Designation

Appendix L
ABM Locations and Bat Activity Levels



PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:100,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	10/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE
BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS OVERVIEW MAP

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1202			
SCALE	SIZE	REFERENCE NO.	REV
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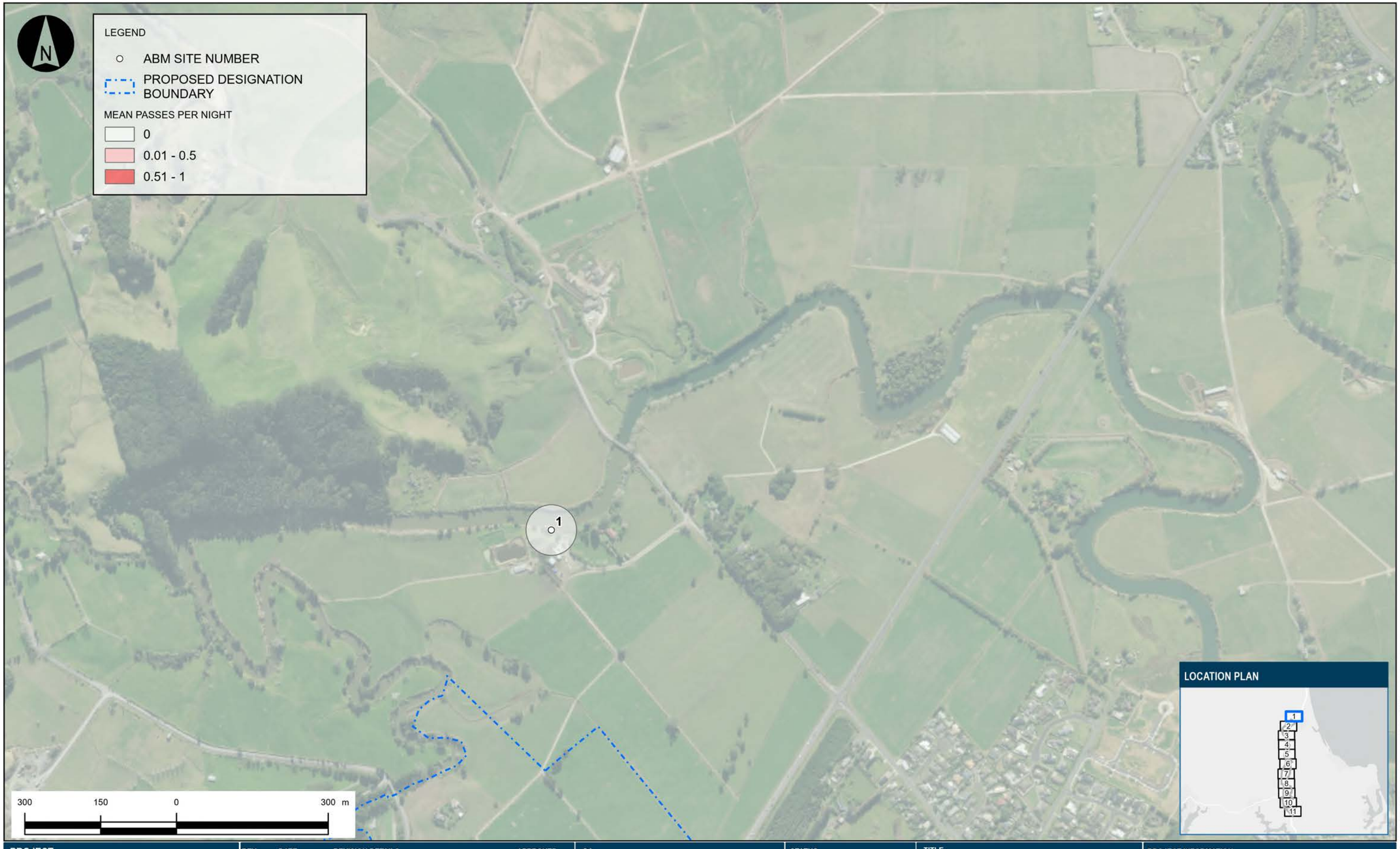

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED

R. DU PLOOY

APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 1 (SEPTEMBER - NOVEMBER 2025) SHEET 1 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1203

SCALE	SIZE	REFERENCE NO.	REV
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PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 1 (SEPTEMBER - NOVEMBER 2025) SHEET 2 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
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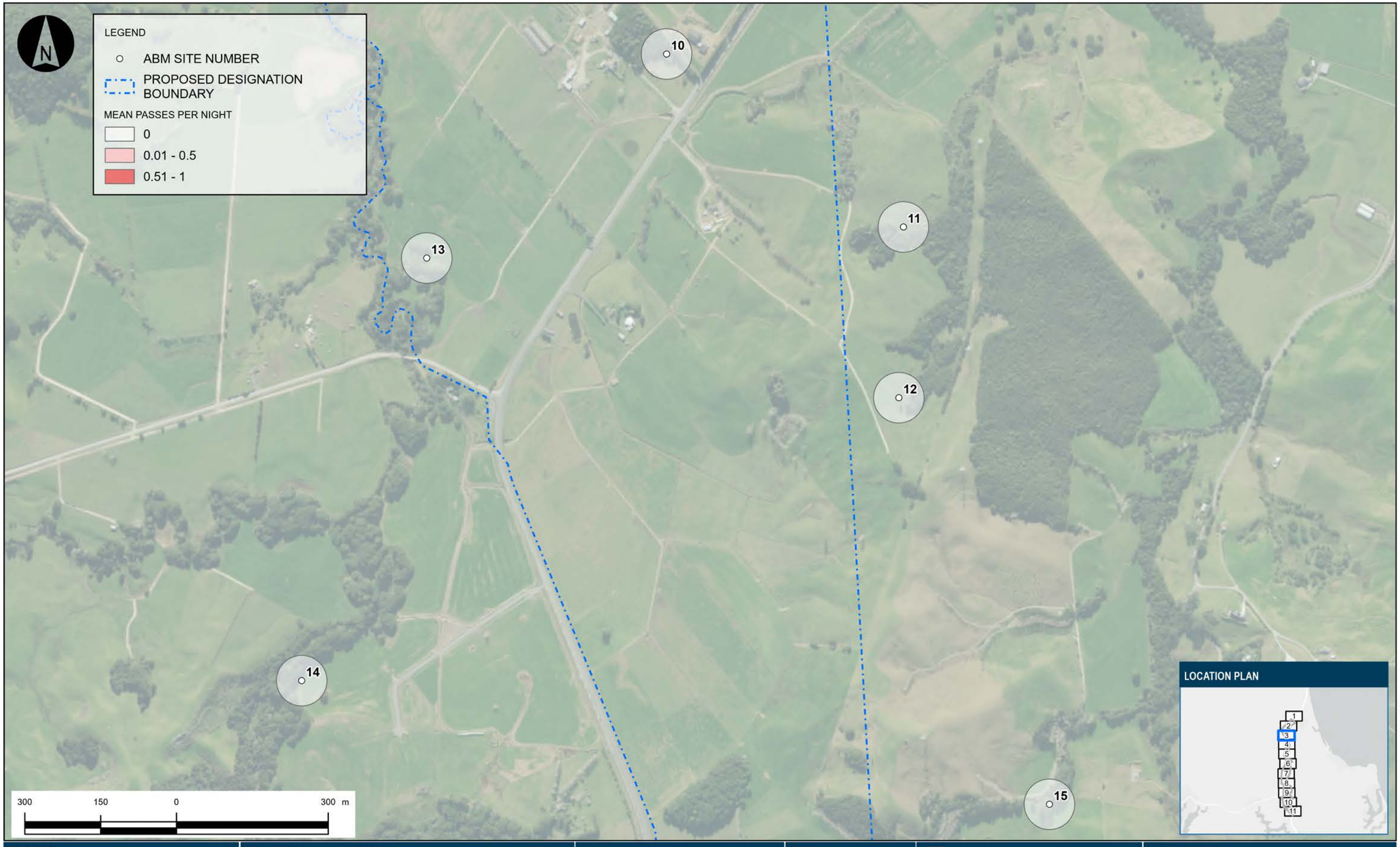

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED: R. DU PLOOY

APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 1 (SEPTEMBER - NOVEMBER 2025) SHEET 3 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1205

SCALE	SIZE	REFERENCE NO.	REV
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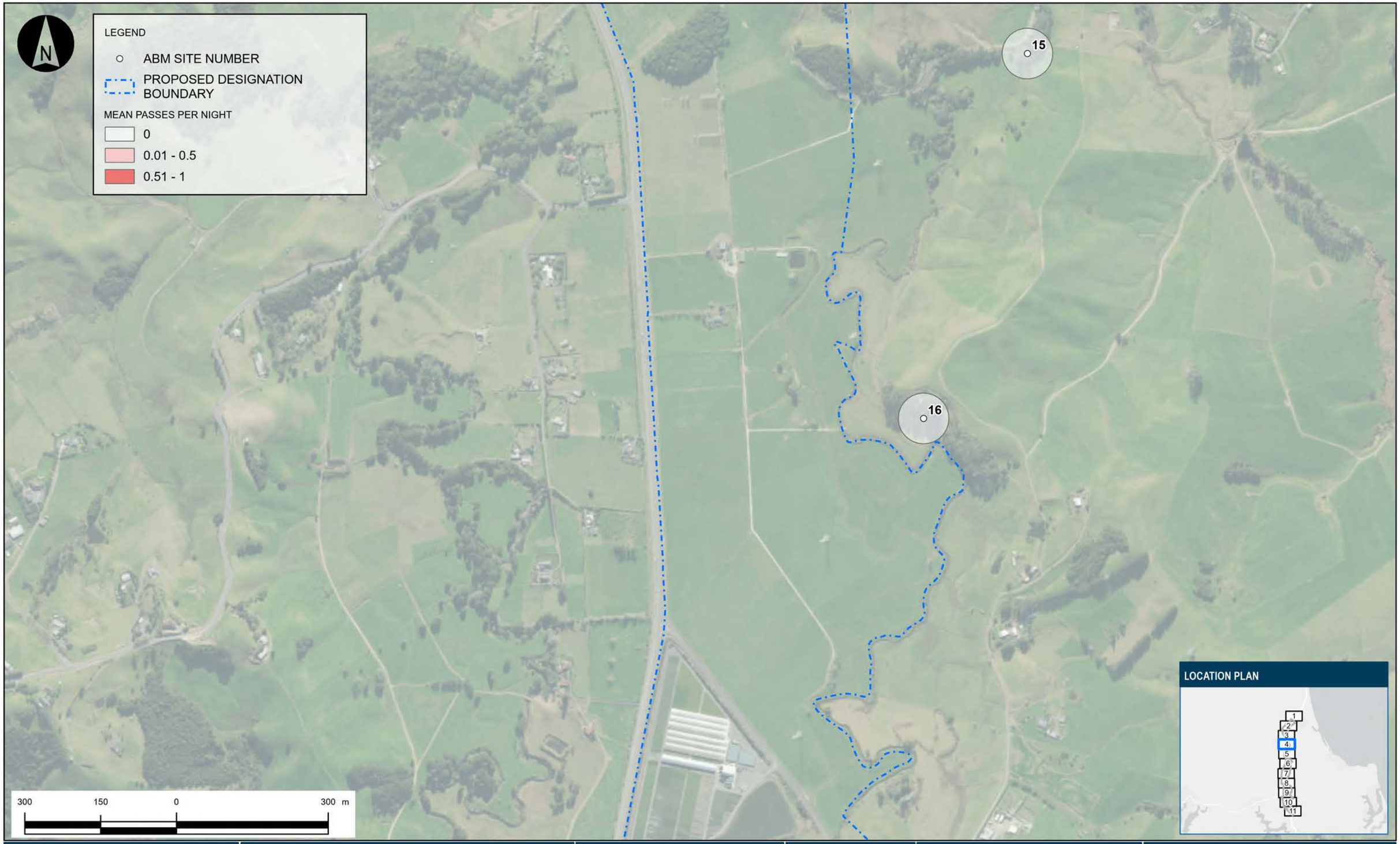

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 1 (SEPTEMBER - NOVEMBER 2025) SHEET 4 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: **10722-PTA-2B0-PE-DRG-1206**

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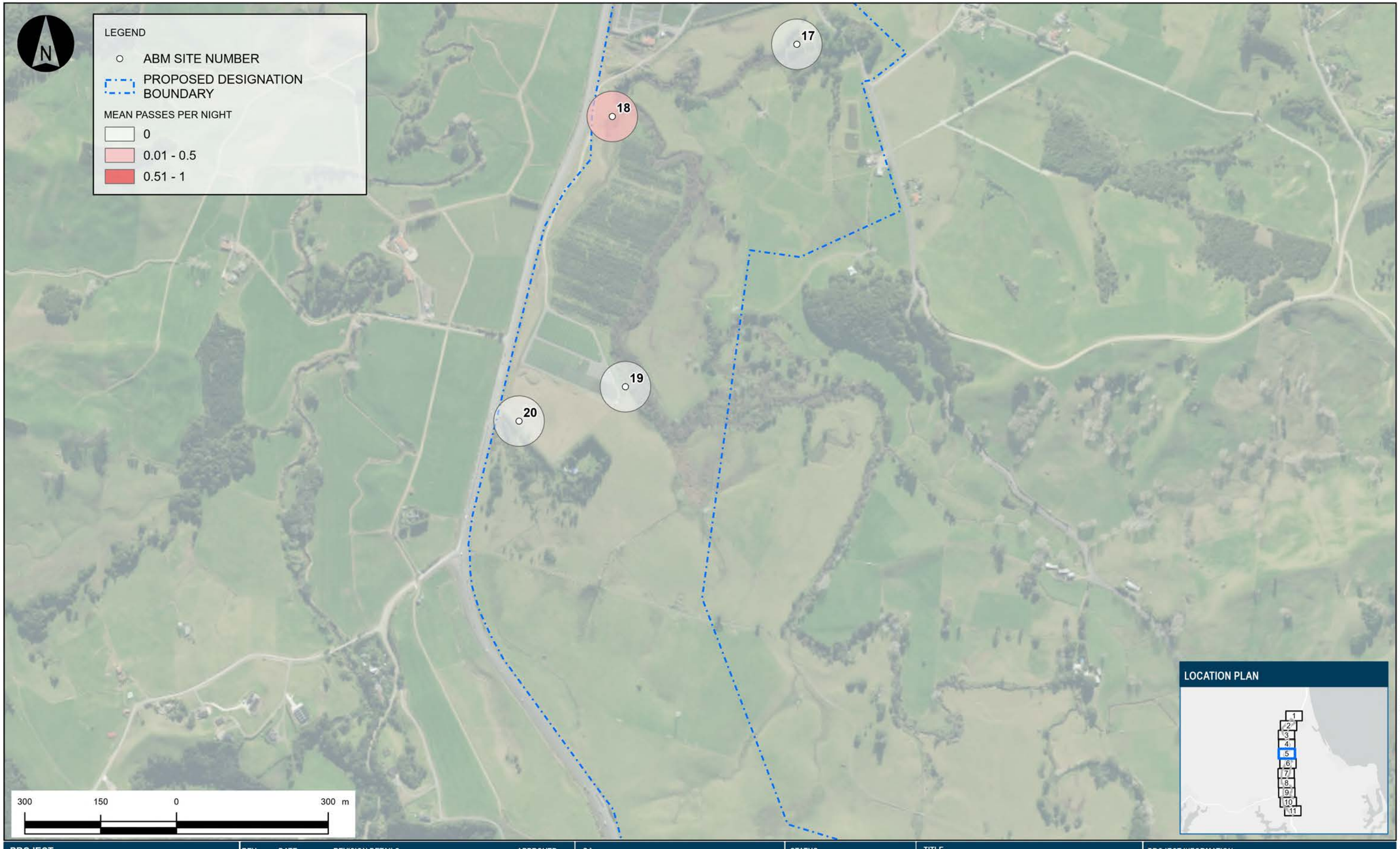

PROJECT				
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance				
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

REV	DATE	REVISION DETAILS	APPROVED
A	18/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 1 (SEPTEMBER - NOVEMBER 2025) SHEET 5 OF 11

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1207			
SCALE	SIZE	REFERENCE NO.	REV
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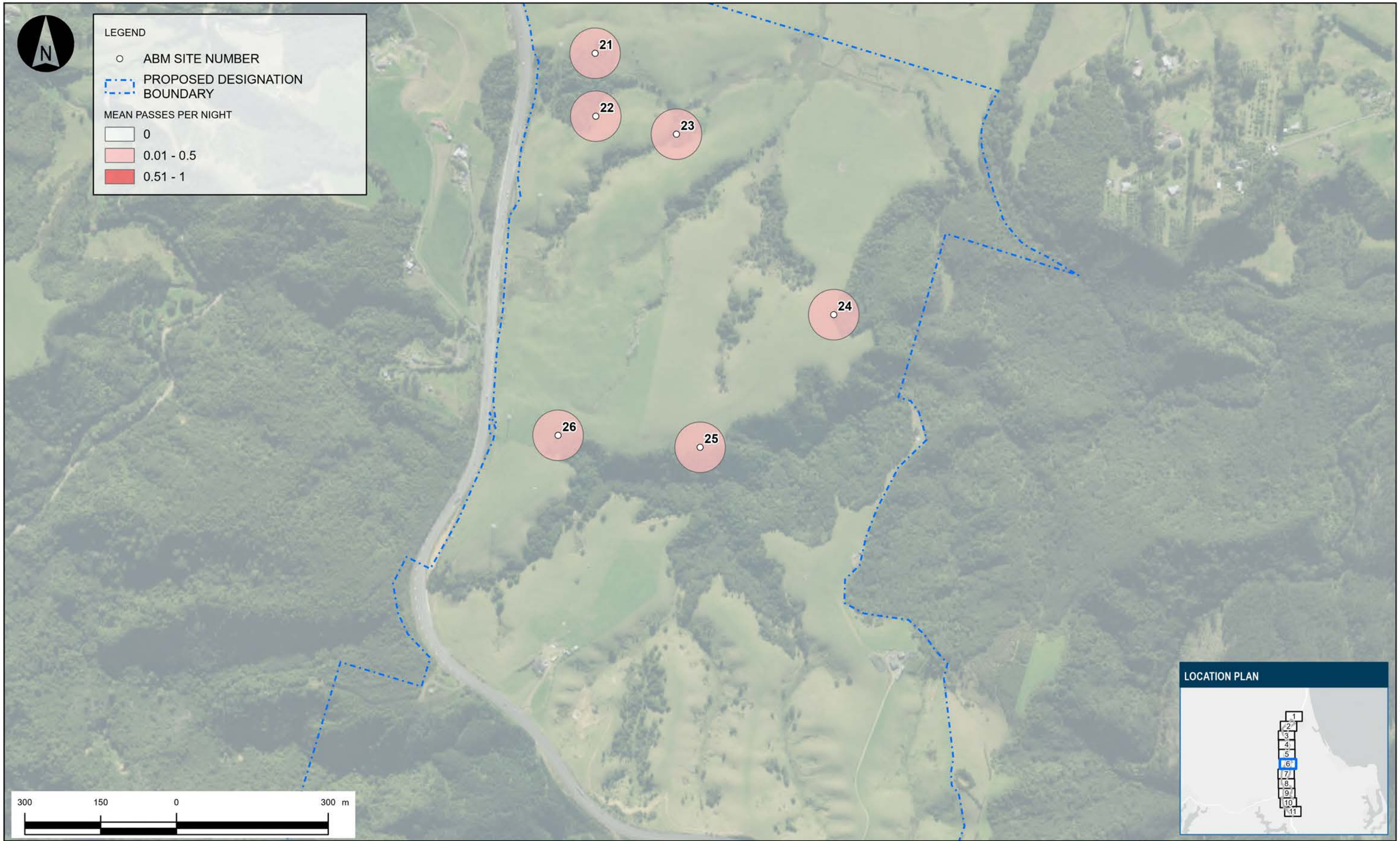

LOCATION PLAN

PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	18/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 1 (SEPTEMBER - NOVEMBER 2025) SHEET 6 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1208

SCALE	SIZE	REFERENCE NO.	REV
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Printed on 2026-Mar-31 at 6:02 pm | Drawn by: H SANTOS | Original File: C:\Users\hsa191\Documents\PROJECTS\Northland Corridor

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 1
(SEPTEMBER - NOVEMBER 2025)
SHEET 7 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1209

SCALE	SIZE	REFERENCE NO.	REV
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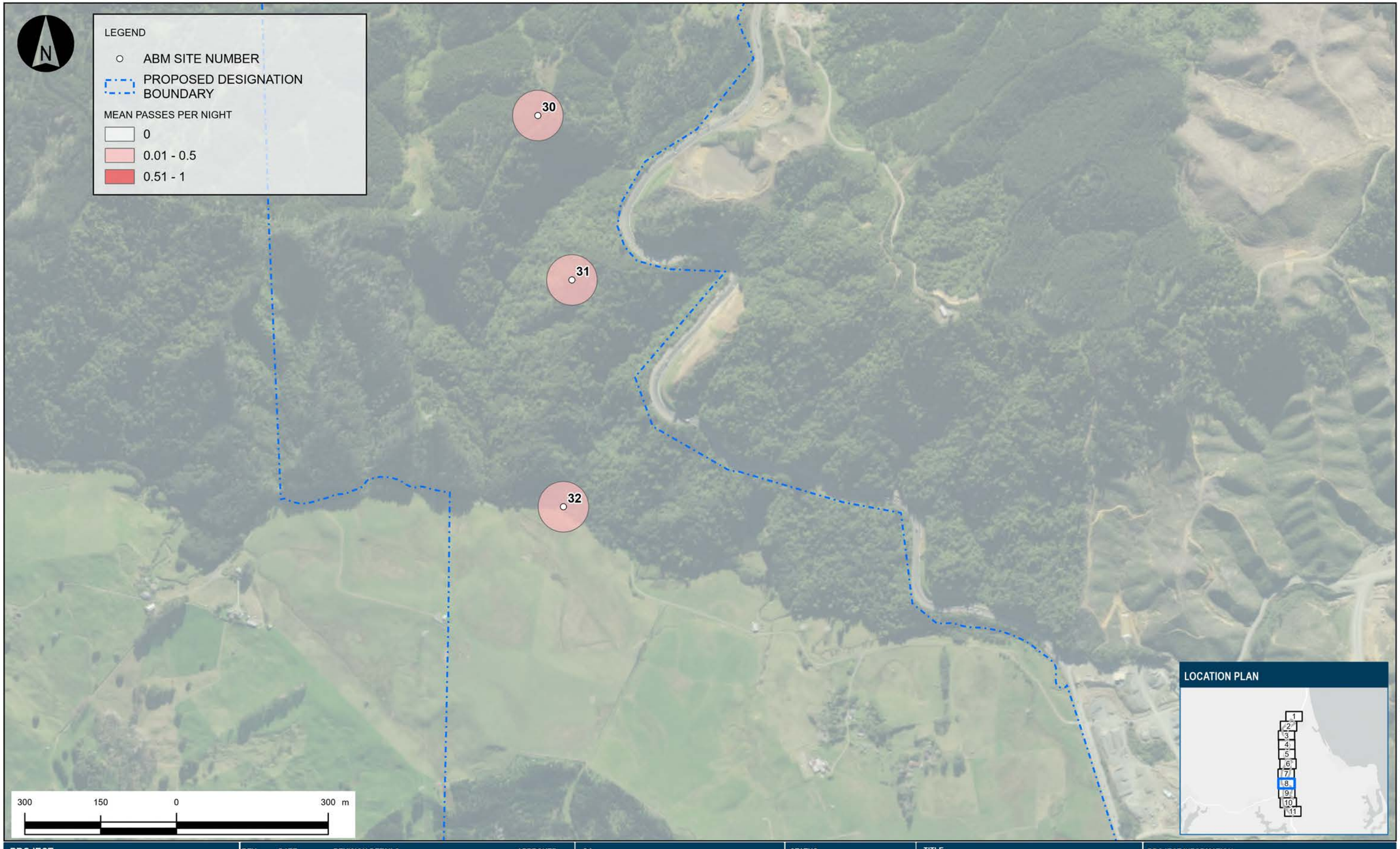

PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	18/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 1
(SEPTEMBER - NOVEMBER 2025)
SHEET 8 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1210

SCALE	SIZE	REFERENCE NO.	REV
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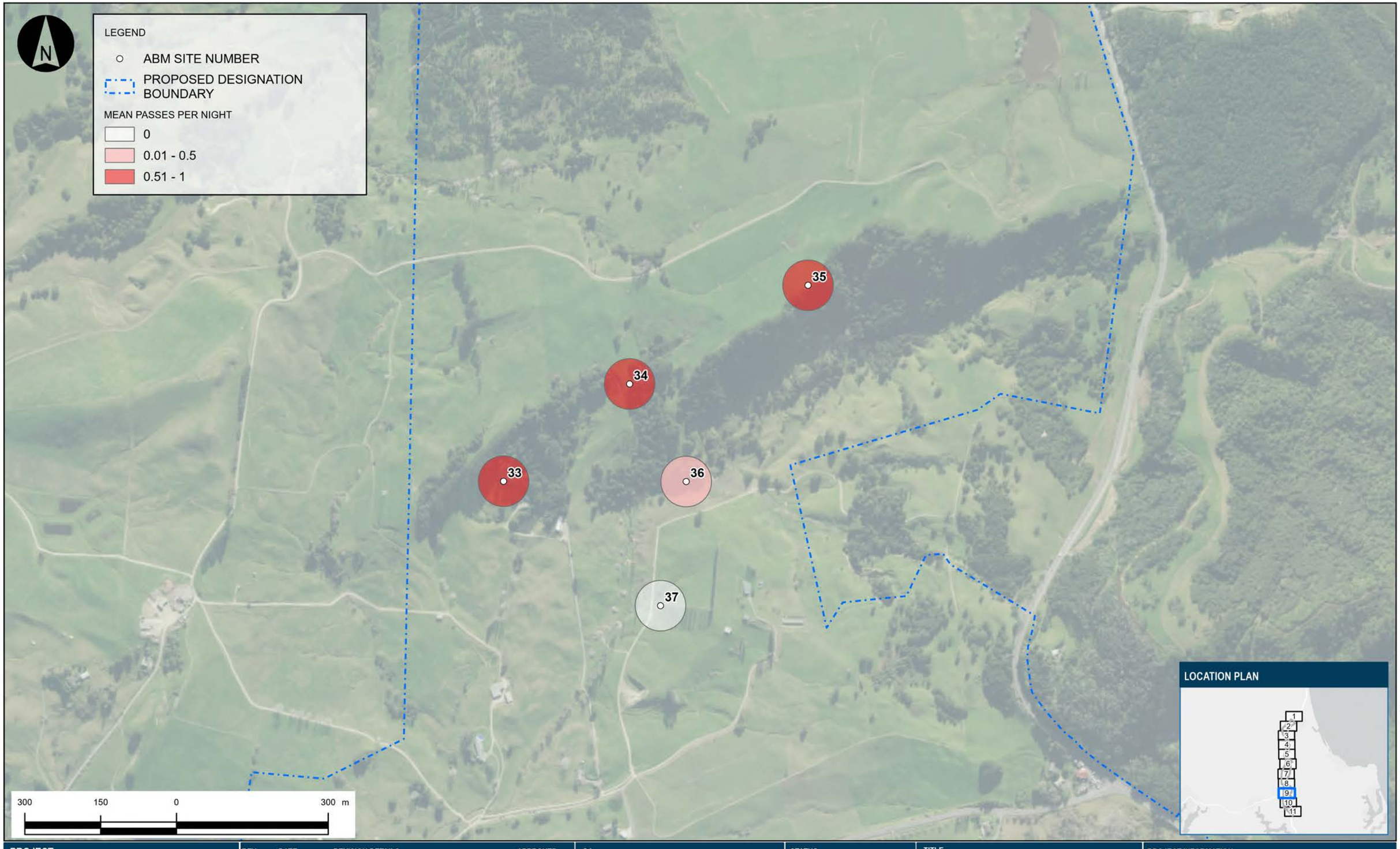

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED: R. DU PLOOY

APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 1 (SEPTEMBER - NOVEMBER 2025) SHEET 9 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1211

SCALE	SIZE	REFERENCE NO.	REV
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PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 1
(SEPTEMBER - NOVEMBER 2025)
SHEET 10 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1212

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1212	D

PROJECT								
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance								
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator								

REV	DATE	REVISION DETAILS	APPROVED
A	18/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 1
(SEPTEMBER - NOVEMBER 2025)
SHEET 11 OF 11

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1213			
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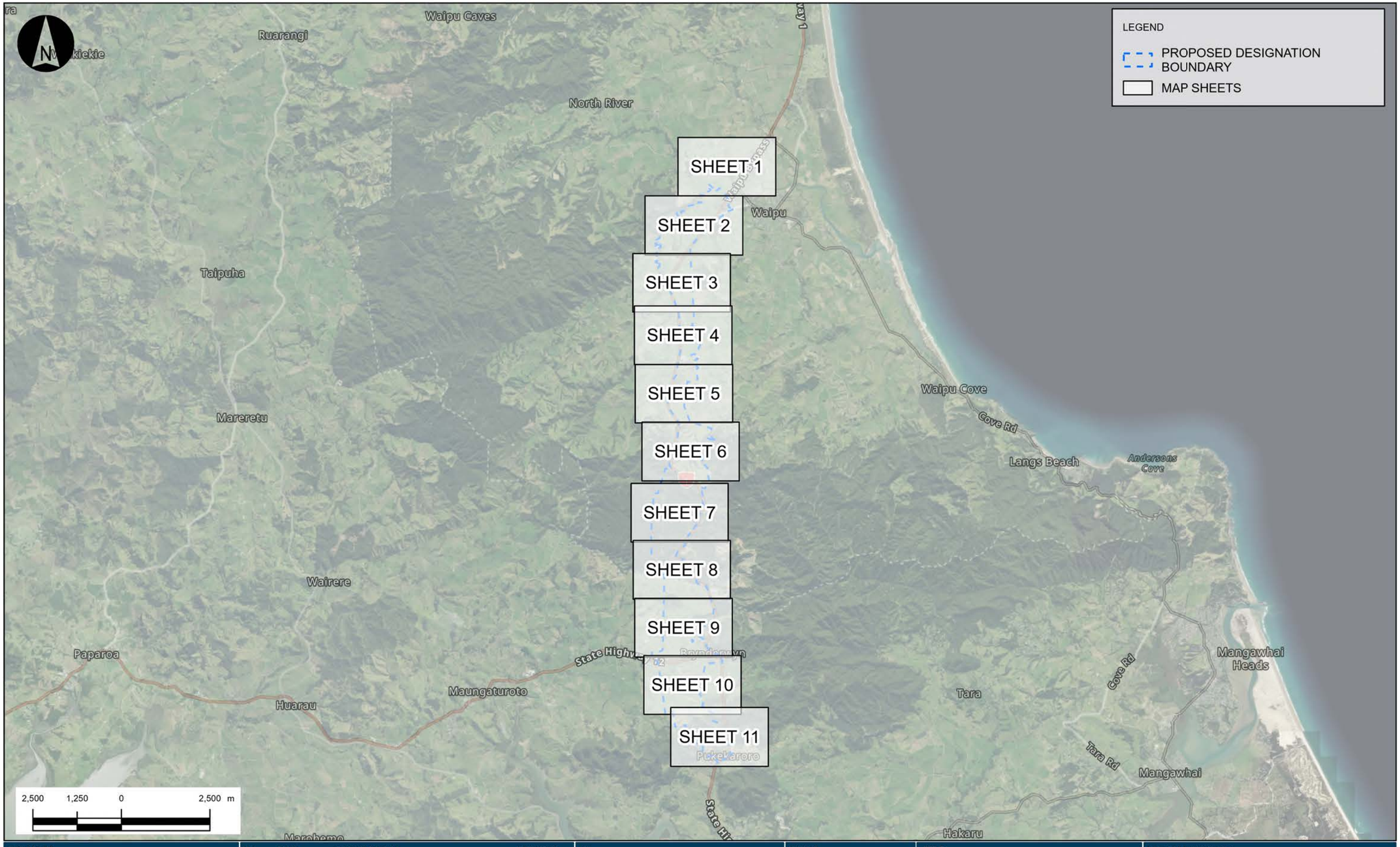

PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:100,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	10/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE
BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS OVERVIEW MAP

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1202			
SCALE	SIZE	REFERENCE NO.	REV
1:100,000	A3	PE-1202	C

PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	18/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 2 (JANUARY - FEBRUARY 2026) SHEET 1 OF 11

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1203			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1203	E

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 2 (JANUARY - FEBRUARY 2026) SHEET 2 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1204

SCALE	SIZE	REFERENCE NO.	REV
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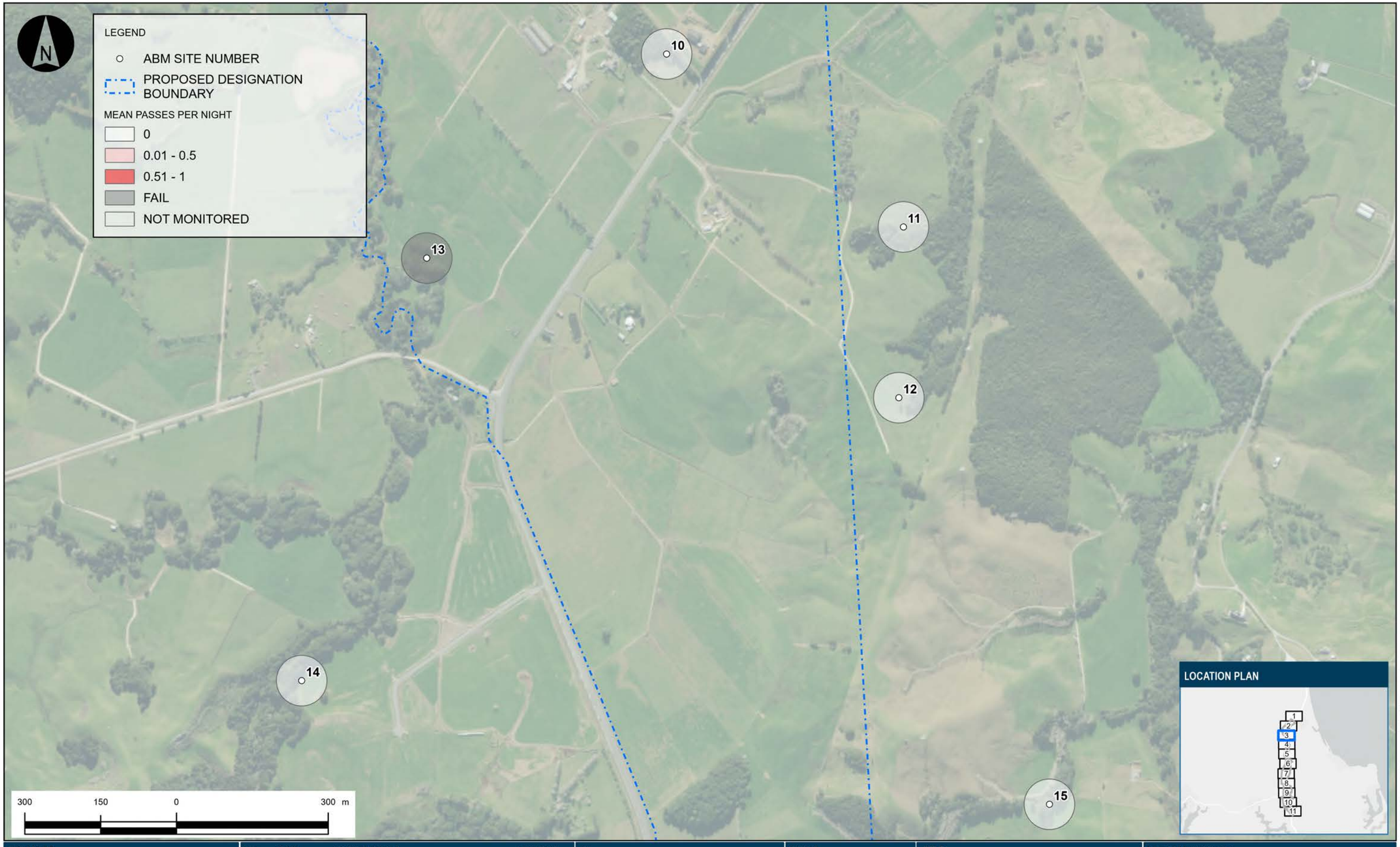

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 2 (JANUARY - FEBRUARY 2026) SHEET 3 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1205

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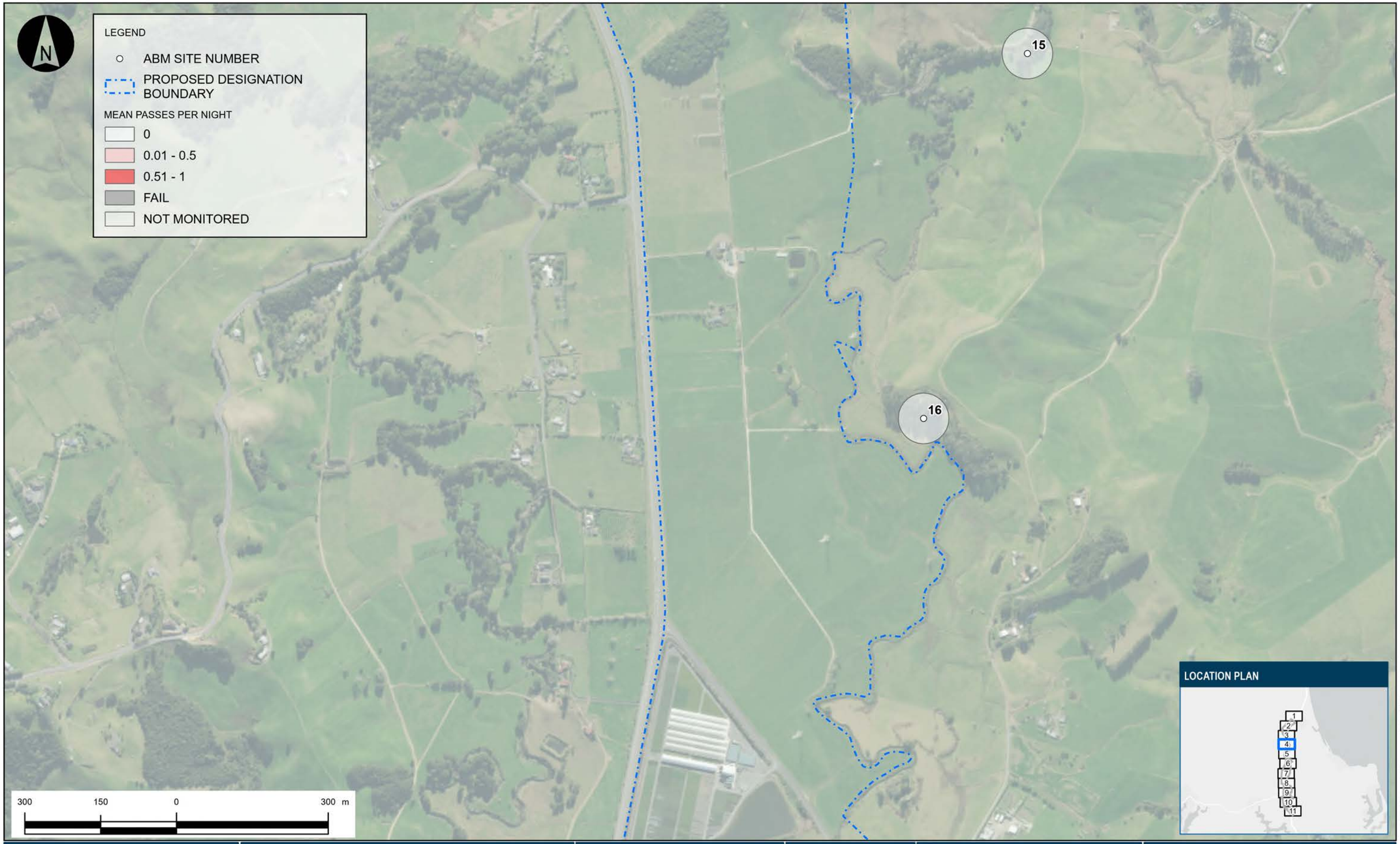

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 2 (JANUARY - FEBRUARY 2026) SHEET 4 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1206

SCALE	SIZE	REFERENCE NO.	REV
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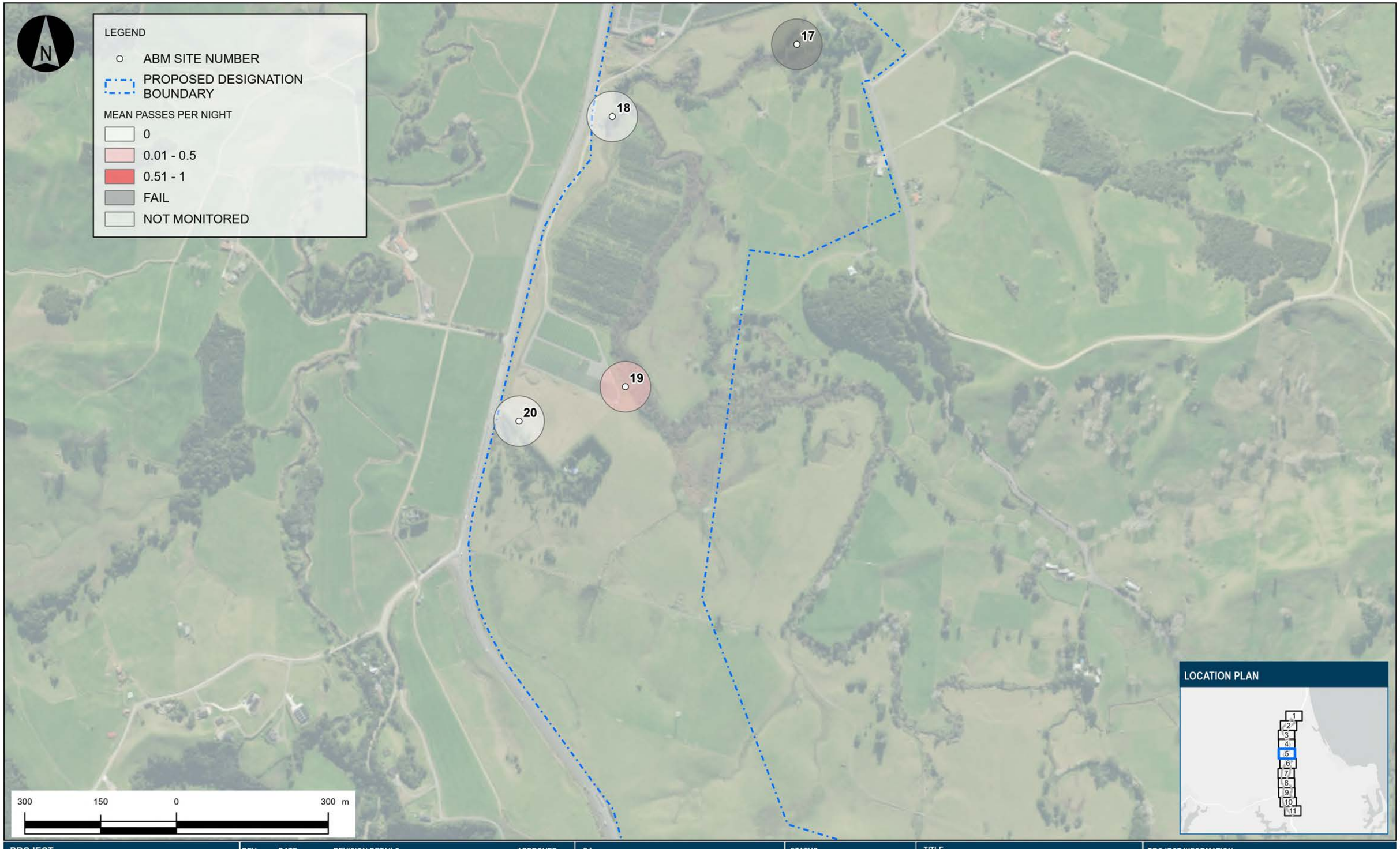

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 2
(JANUARY - FEBRUARY 2026)
SHEET 5 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1207

SCALE	SIZE	REFERENCE NO.	REV
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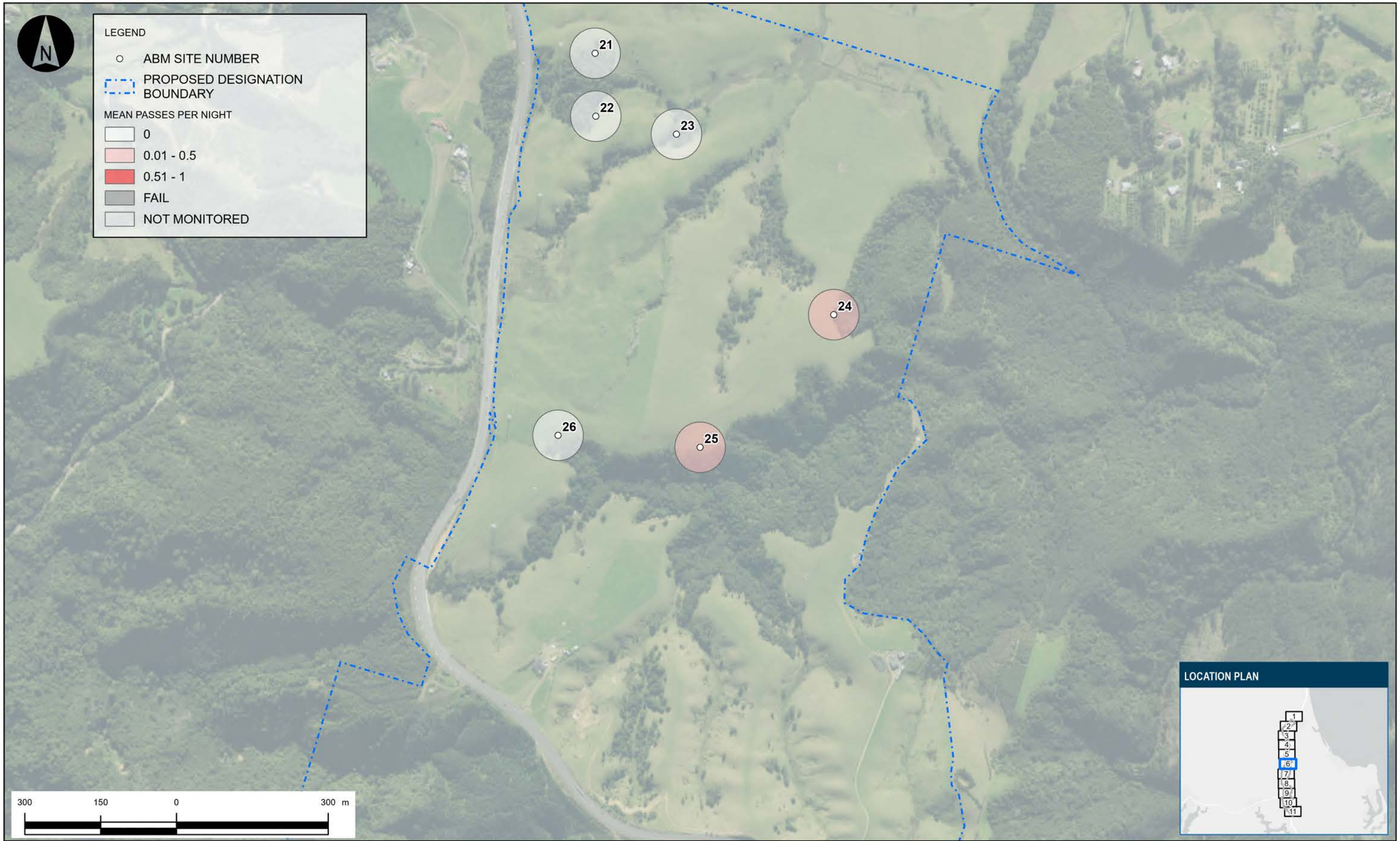

PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	18/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 2 (JANUARY - FEBRUARY 2026) SHEET 6 OF 11

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1208			
SCALE	SIZE	REFERENCE NO.	REV
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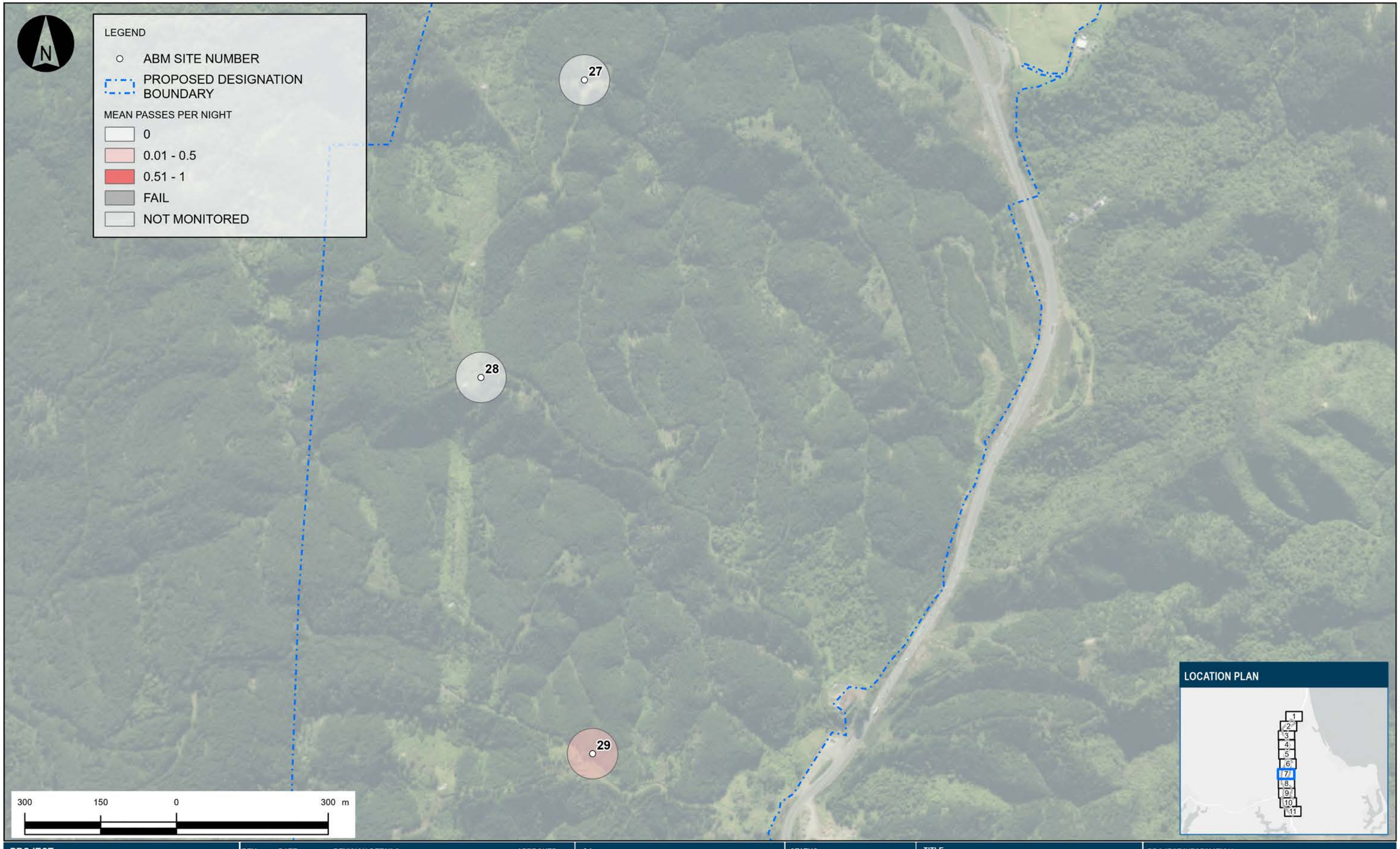

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS

FOR INFORMATION

APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION BAT ACTIVITY LEVELS SURVEY 2 (JANUARY - FEBRUARY 2026) SHEET 7 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
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SCALE	SIZE	REFERENCE NO.	REV
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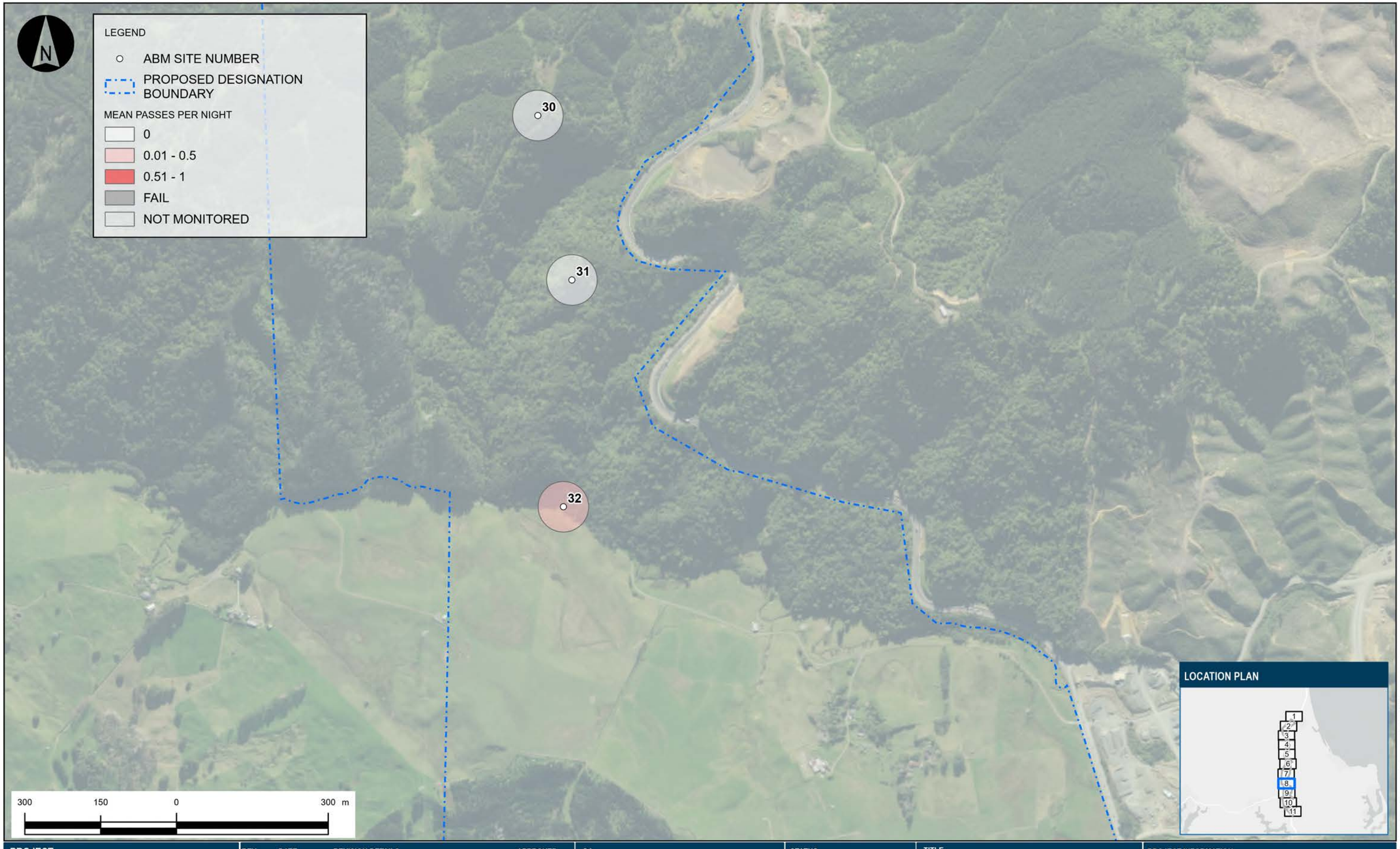

PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	18/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 2
(JANUARY - FEBRUARY 2026)
SHEET 8 OF 11

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1210			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1210	E

PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	18/12/2025	FOR INFORMATION	RDP
B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 2
(JANUARY - FEBRUARY 2026)
SHEET 9 OF 11

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1211			
SCALE	SIZE	REFERENCE NO.	REV
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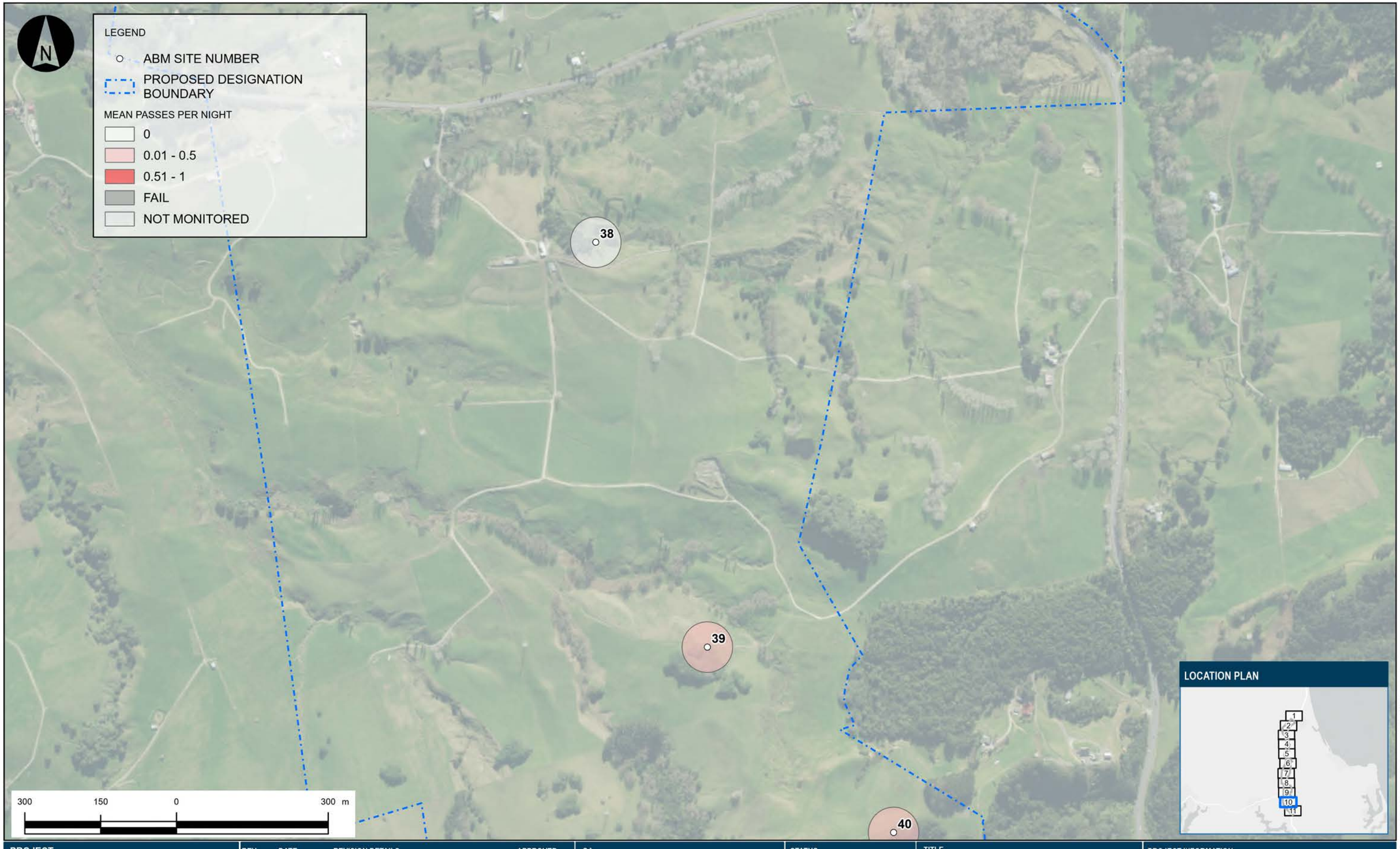

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 2
(JANUARY - FEBRUARY 2026)
SHEET 10 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1212

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1212	E

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	18/12/2025	FOR INFORMATION	RDP
	B	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	C	03/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
	D	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 1)	RDP
	E	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY (SURVEY 2)	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	H. SHARMA	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT ACTIVITY LEVELS SURVEY 2
(JANUARY - FEBRUARY 2026)
SHEET 11 OF 11

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1213

SCALE	SIZE	REFERENCE NO.	REV
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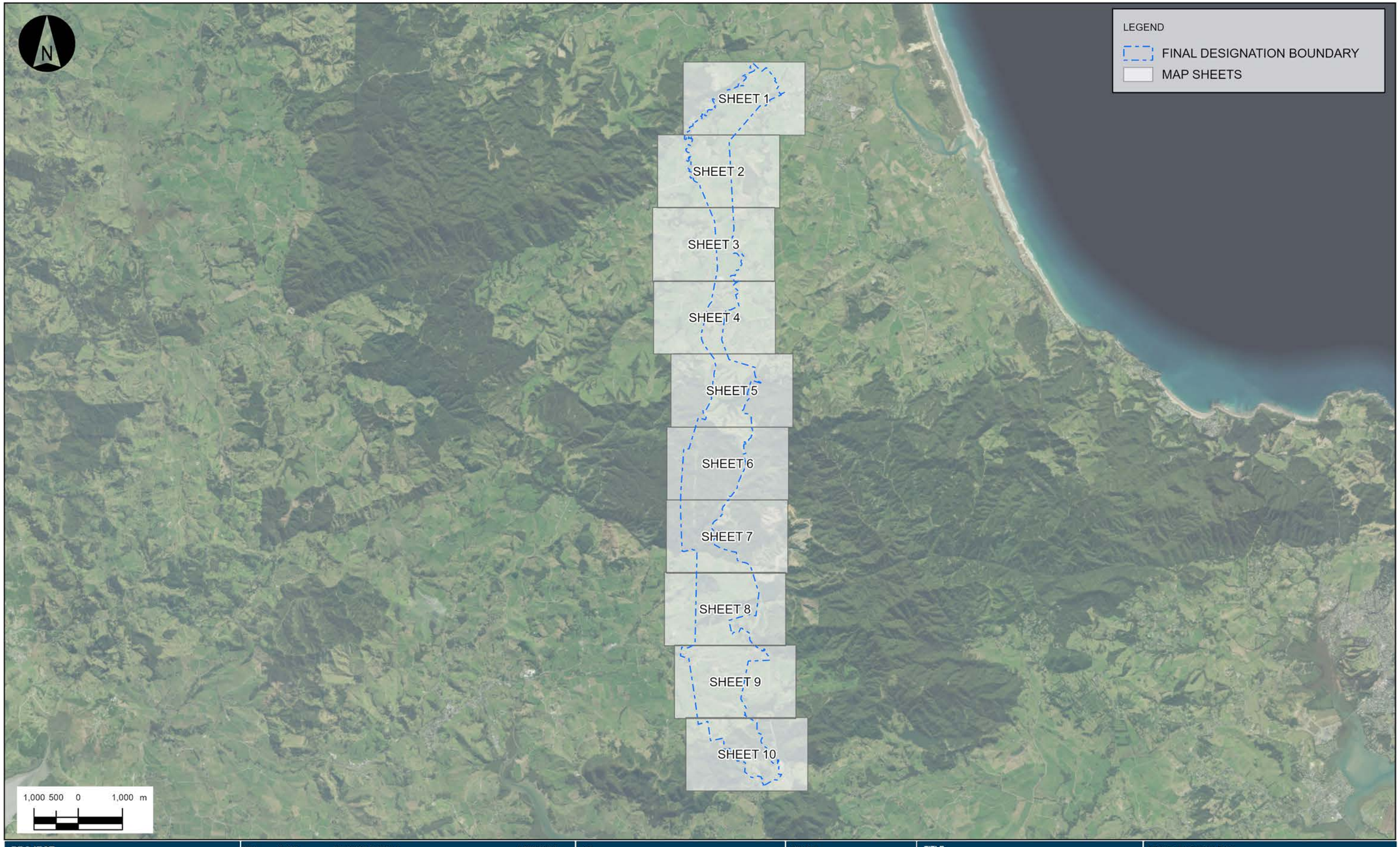
Appendix M
Bat habitat assessment



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	27/03/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:80,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	27/03/2026
CHECKED	H. SANTOS	27/03/2026
REVIEWED	L. DENMEAD	27/03/2026
VERIFIED	H. SANTOS	27/03/2026
PROJECT LEAD	J. HIND	27/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	27/03/2026

TITLE

BRYNDERWYN HILLS SECTION VEGETATION AND BAT HABITAT OVERVIEW MAP

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1165

SCALE	SIZE	REFERENCE NO.	REV
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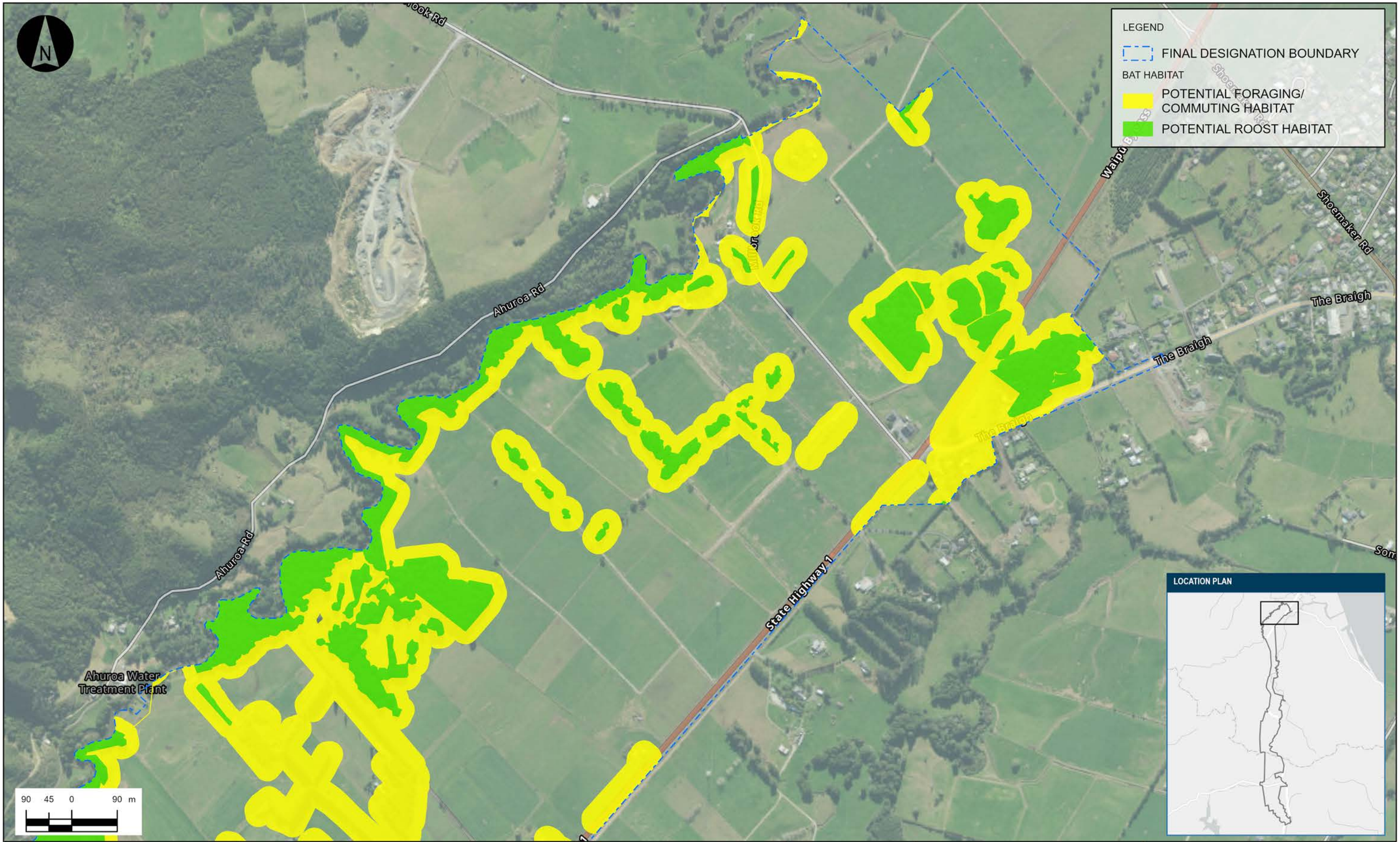


PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000				
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

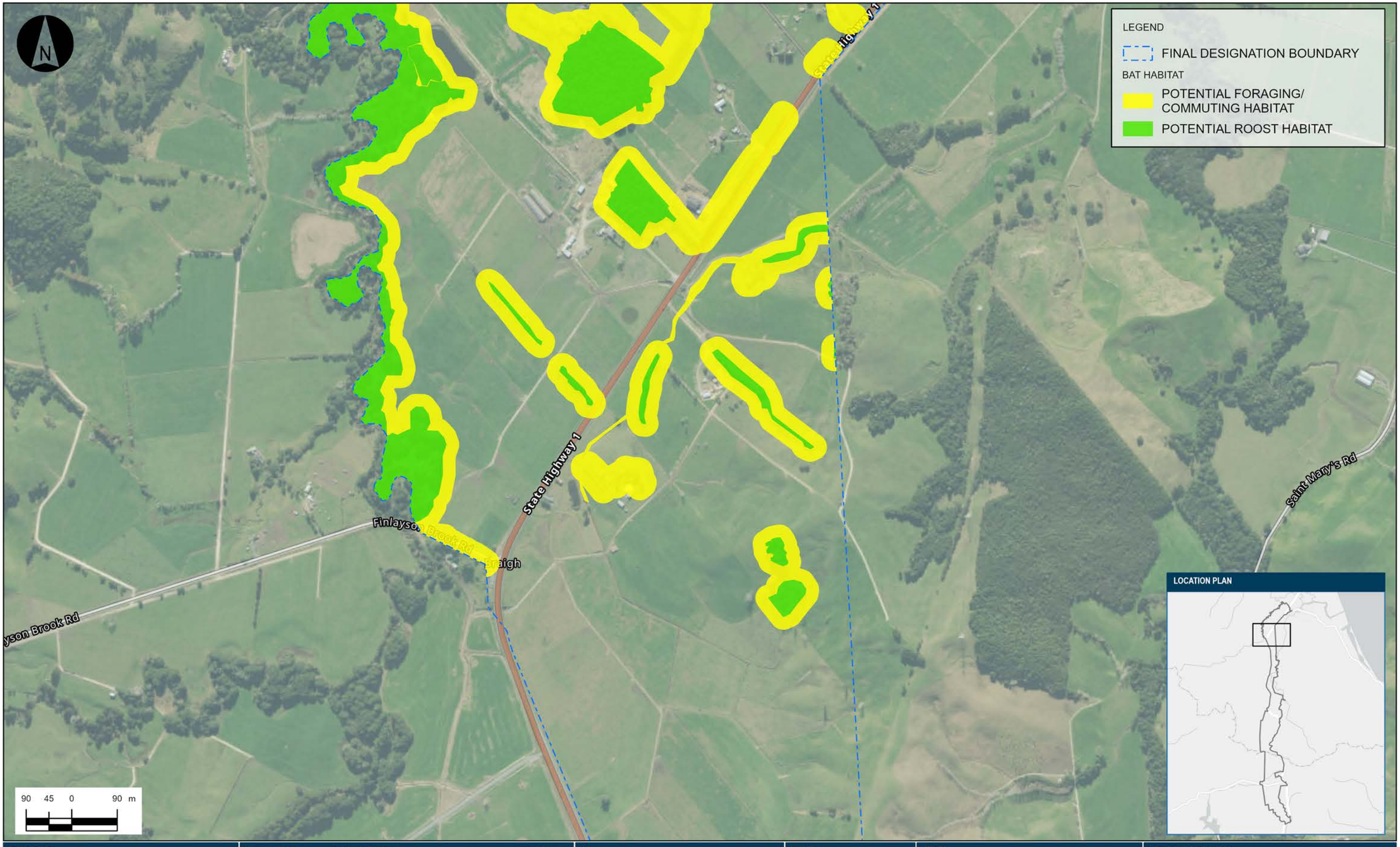
QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 1 OF 10

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1186			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1186	B



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 2 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1187

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1187	B

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000				
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 3 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1188			
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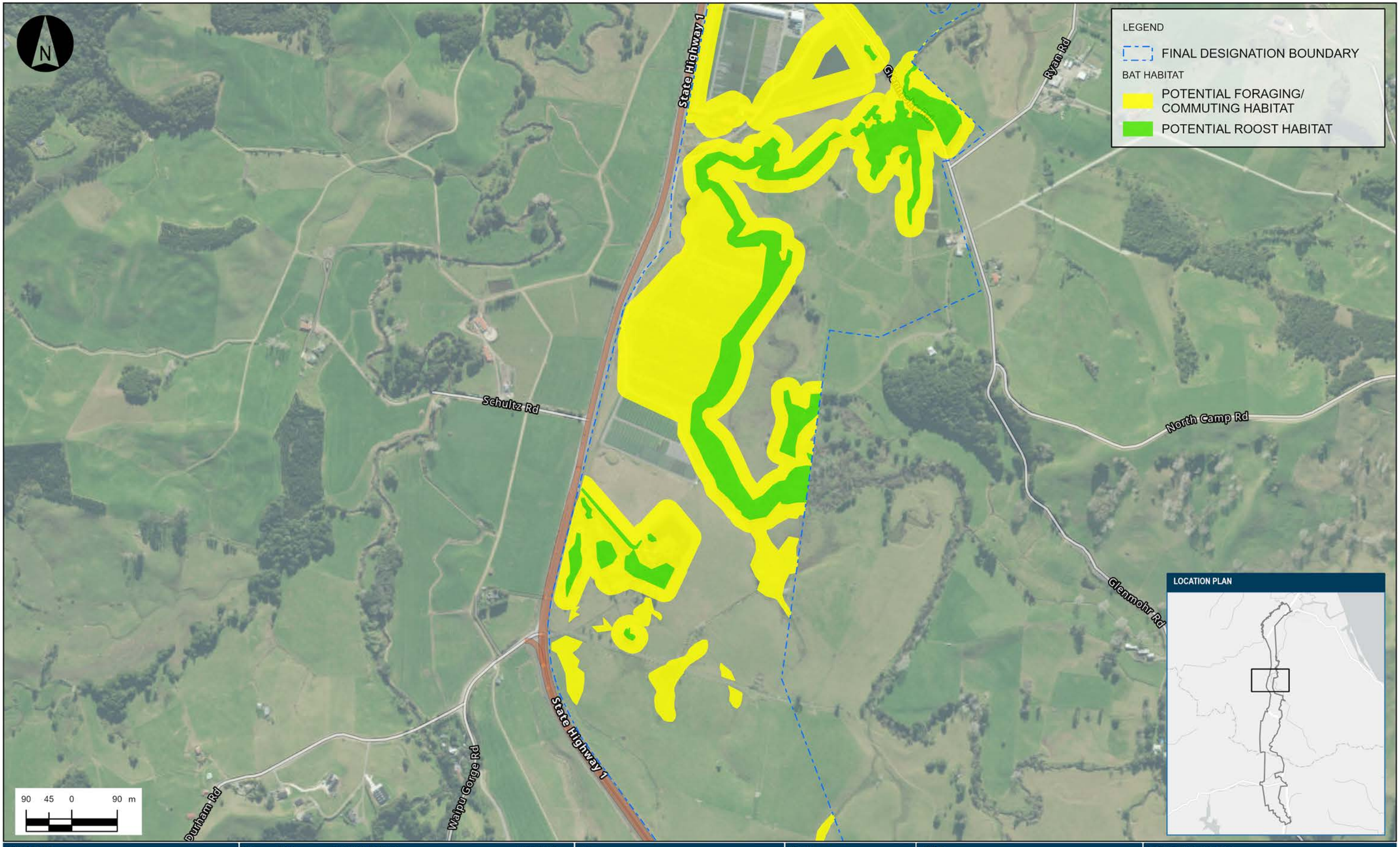

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 4 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1189

SCALE	SIZE	REFERENCE NO.	REV
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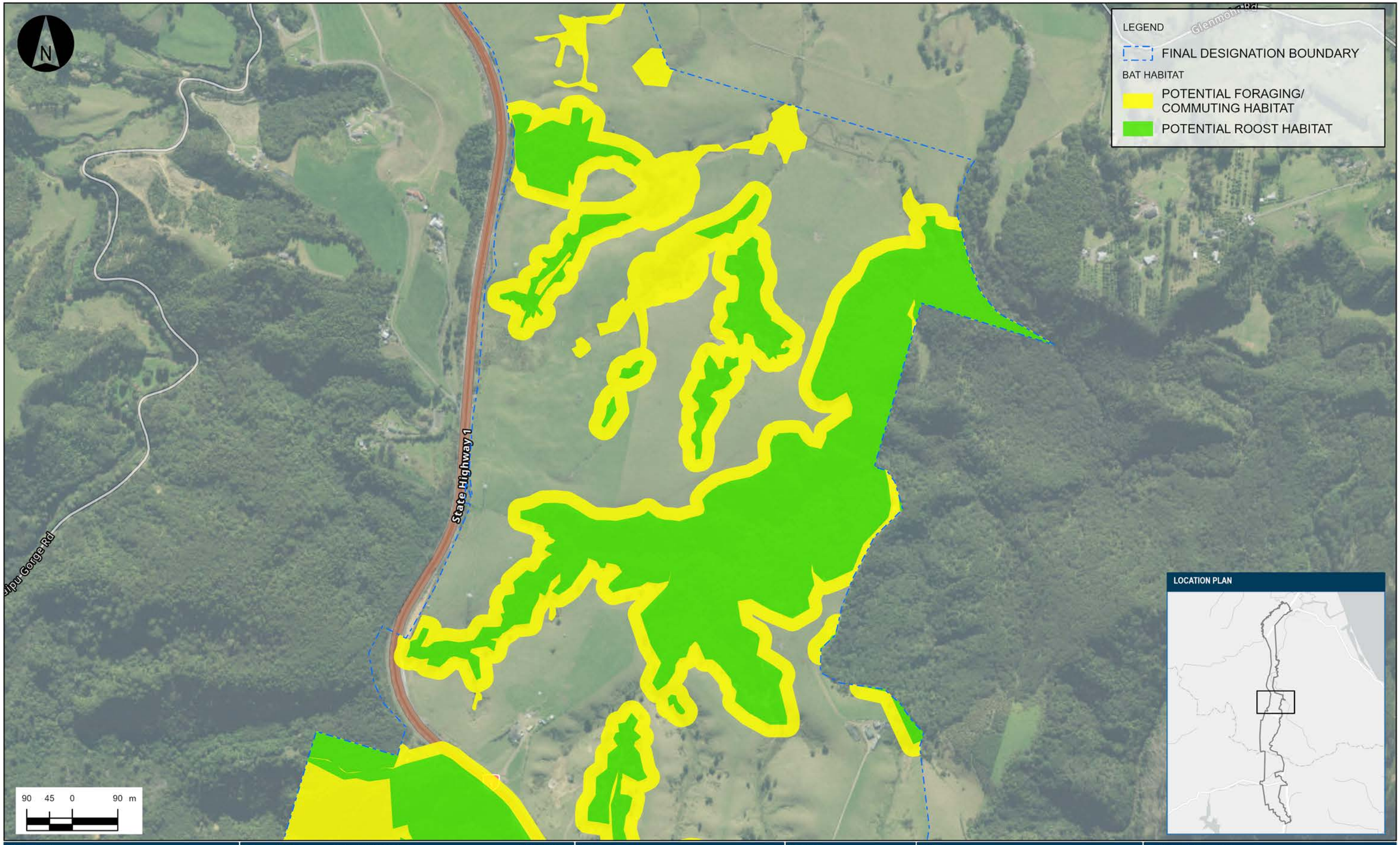

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 5 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1190

SCALE	SIZE	REFERENCE NO.	REV
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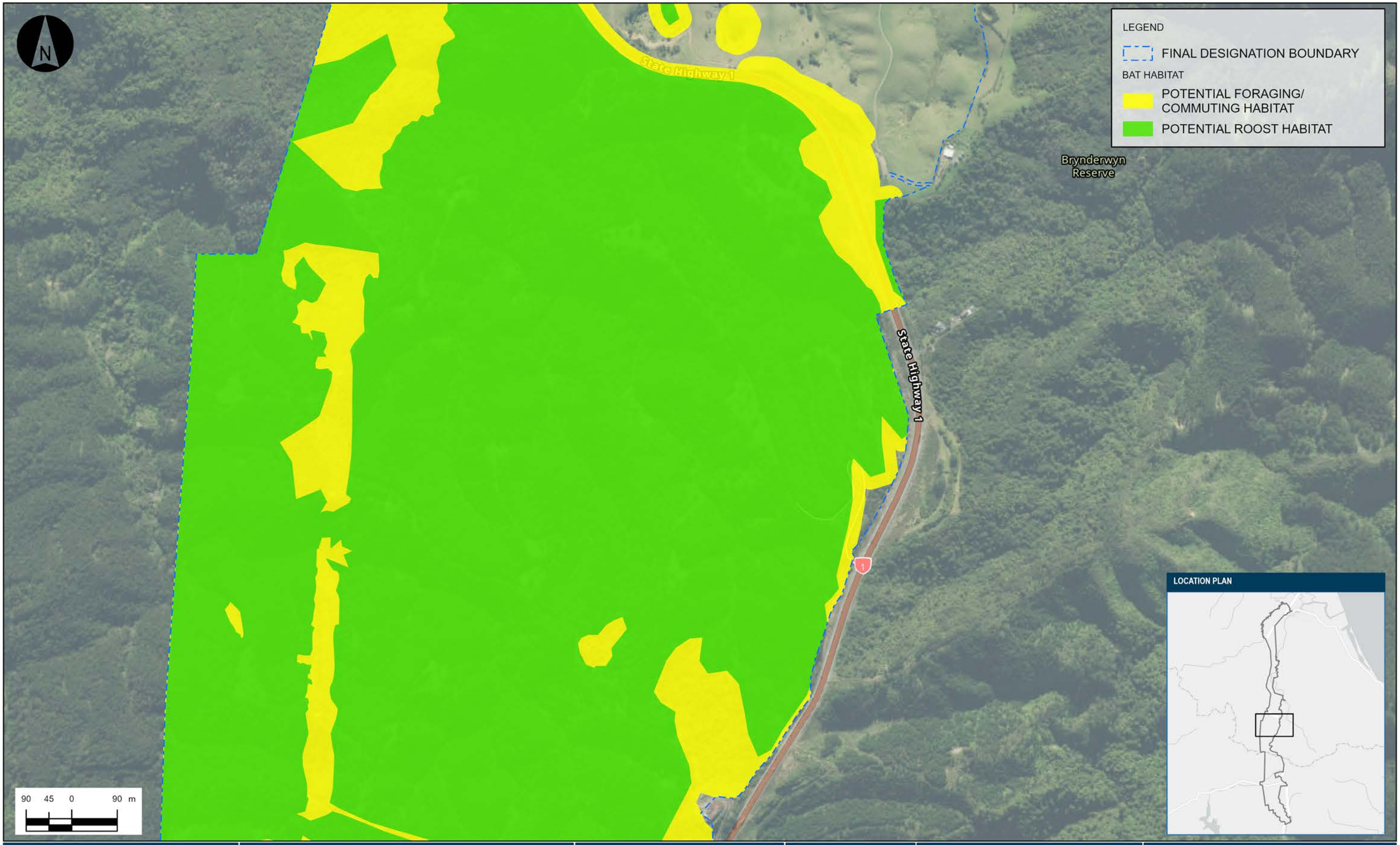

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000				
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 6 OF 10

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1191			
SCALE	SIZE	REFERENCE NO.	REV
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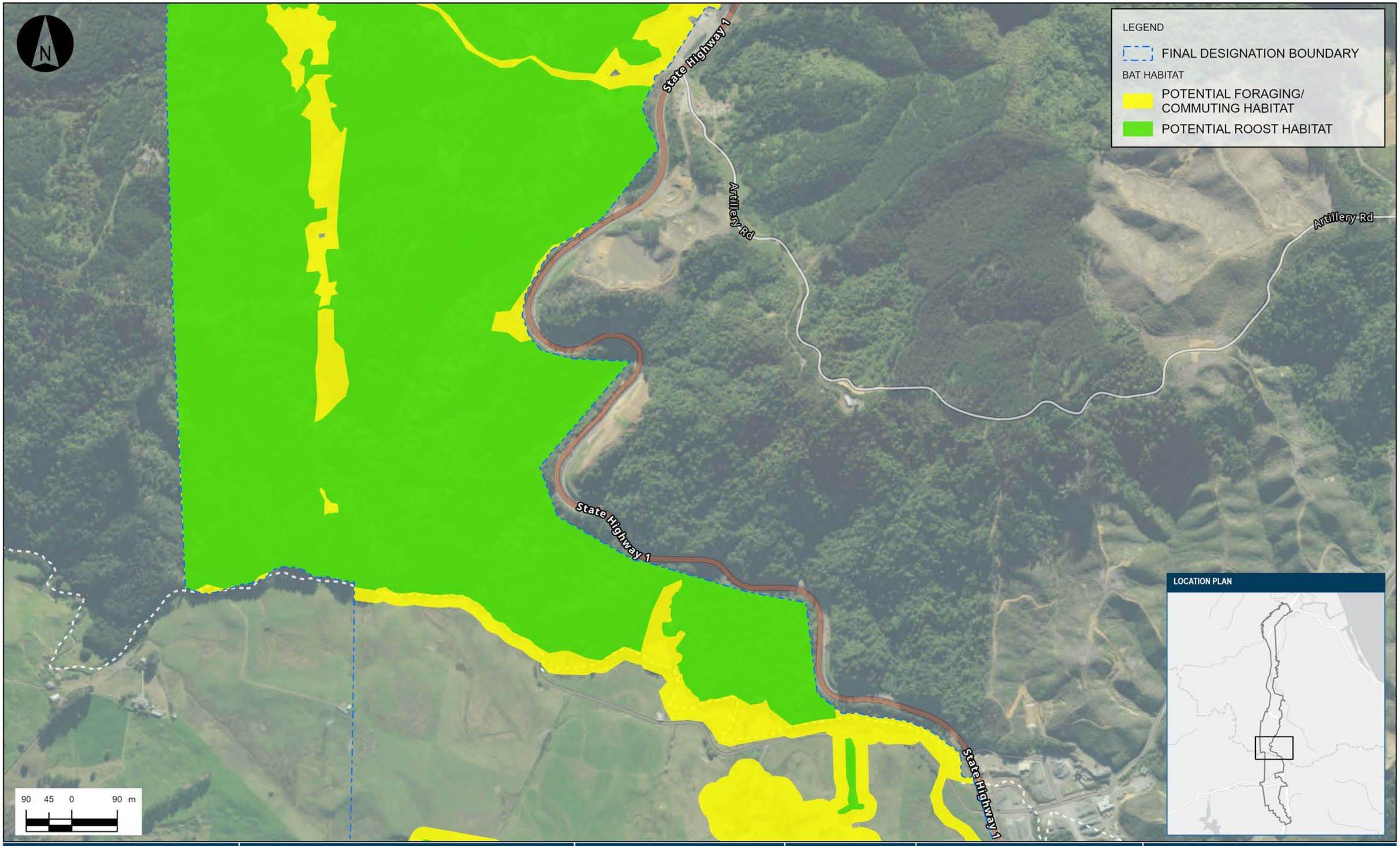

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 7 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1192

SCALE	SIZE	REFERENCE NO.	REV
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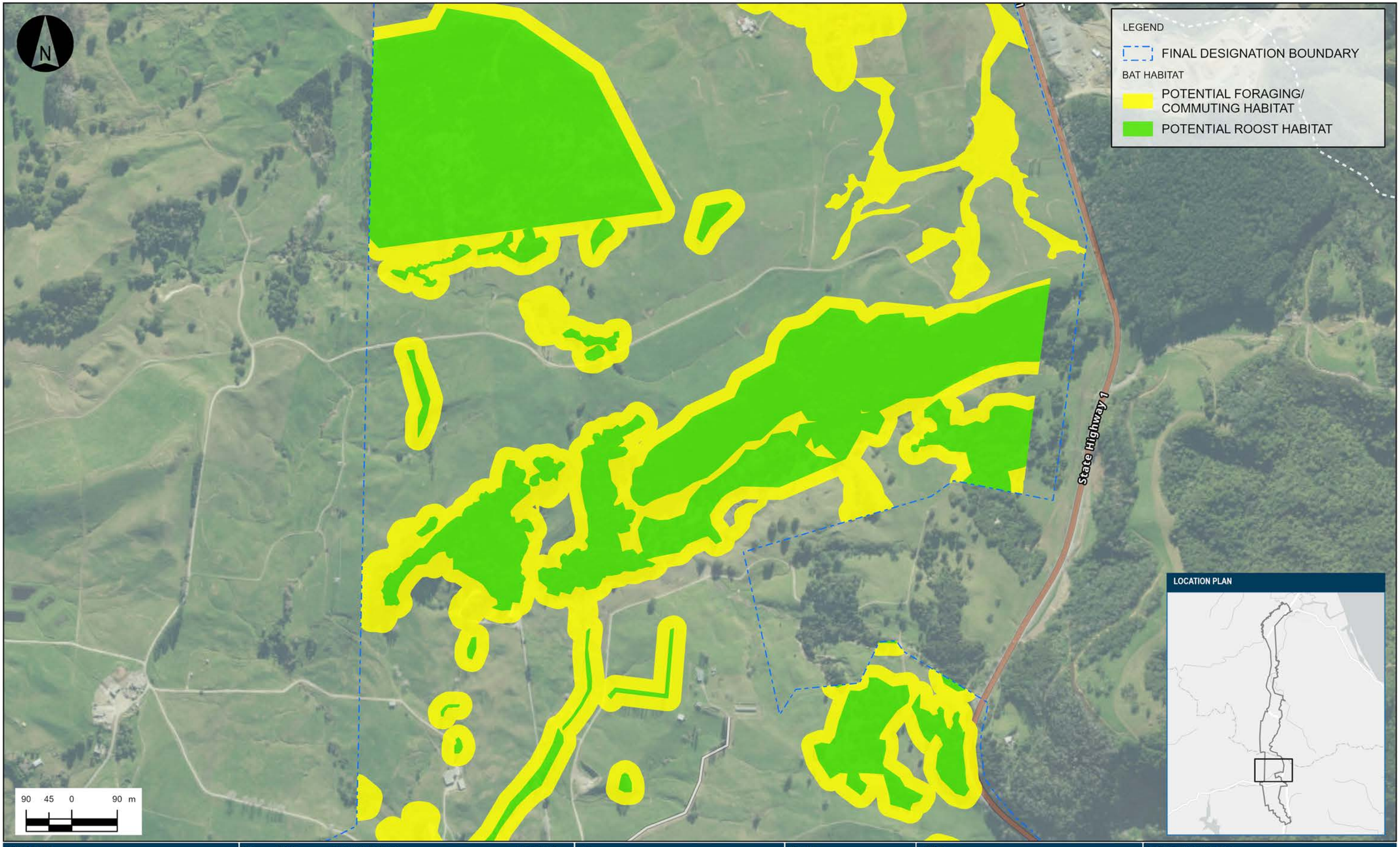

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 8 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1193

SCALE	SIZE	REFERENCE NO.	REV
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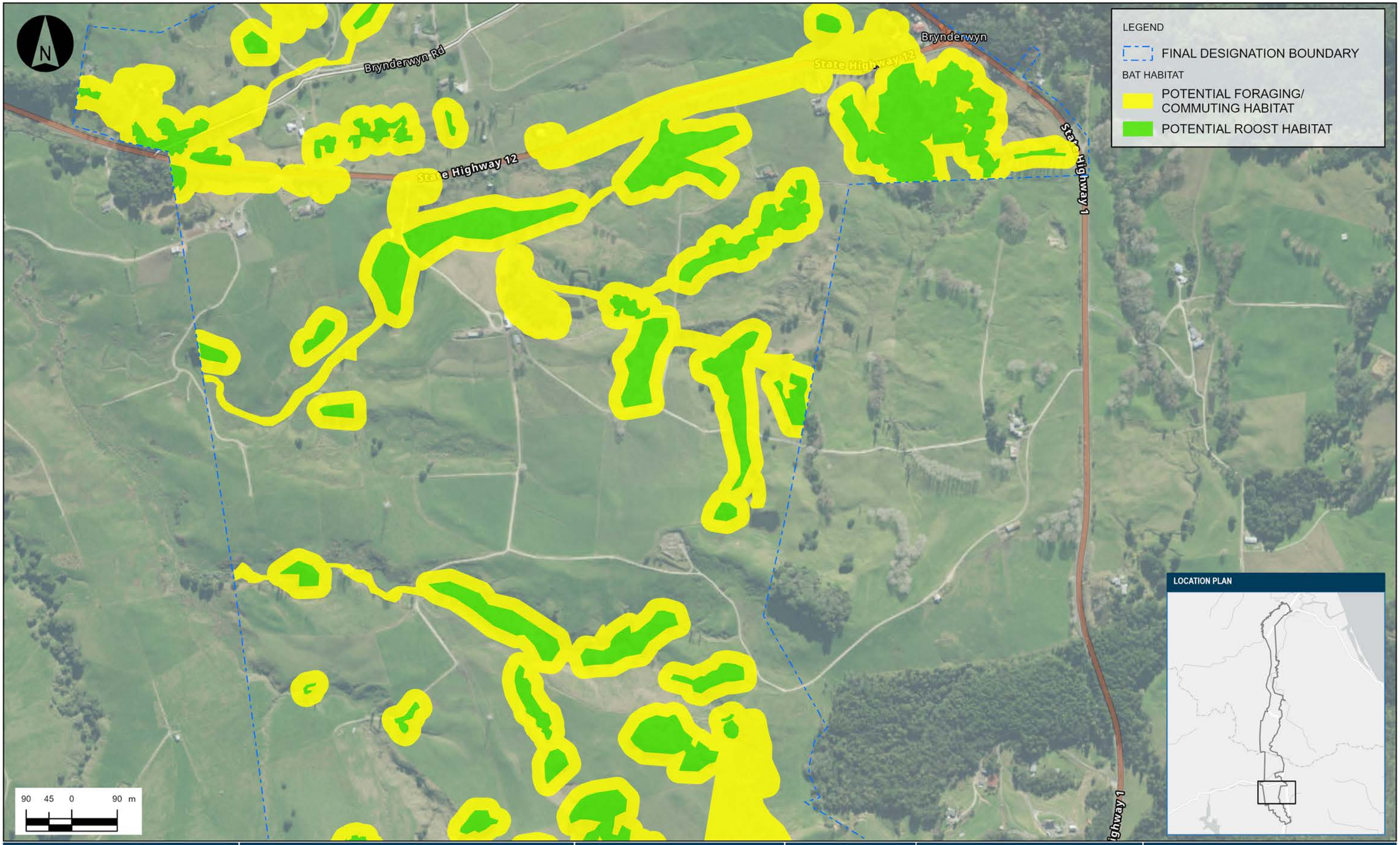


PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS

FOR INFORMATION

APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

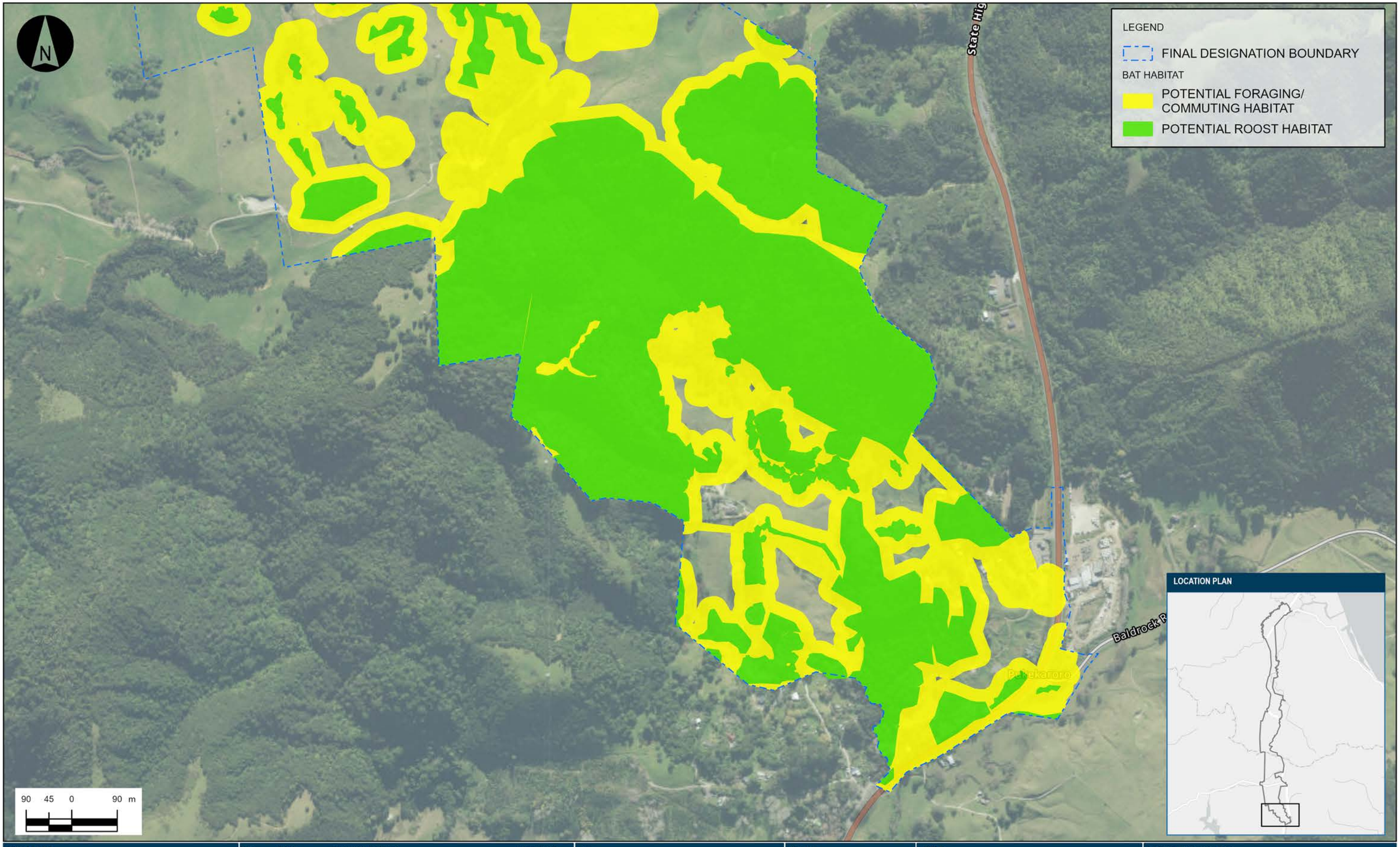
BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 9 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE
10722-PTA-2B0-PE-DRG-1194

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1194	B



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000				
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	H. SHARMA	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
BAT HABITAT ASSESSMENT
SHEET 10 OF 10

PROJECT INFORMATION

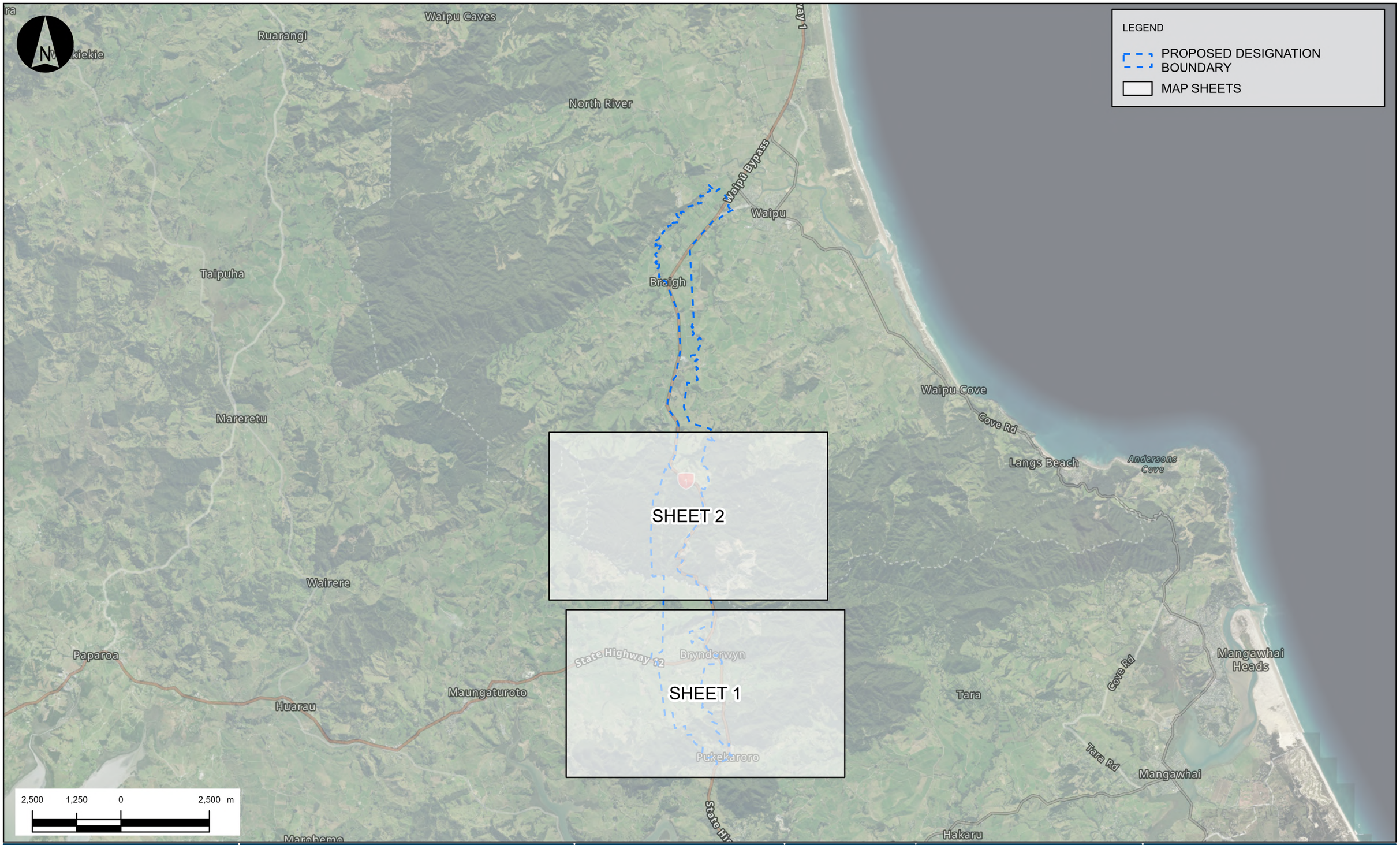
NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1195

SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1195	B

Appendix N
Snail results



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	10/12/2025	FOR INFORMATION	RDP
	B	10/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:100,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	J. WU	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	T. IRELAND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION AT RISK SNAIL OBSERVATIONS OVERVIEW MAP

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1152

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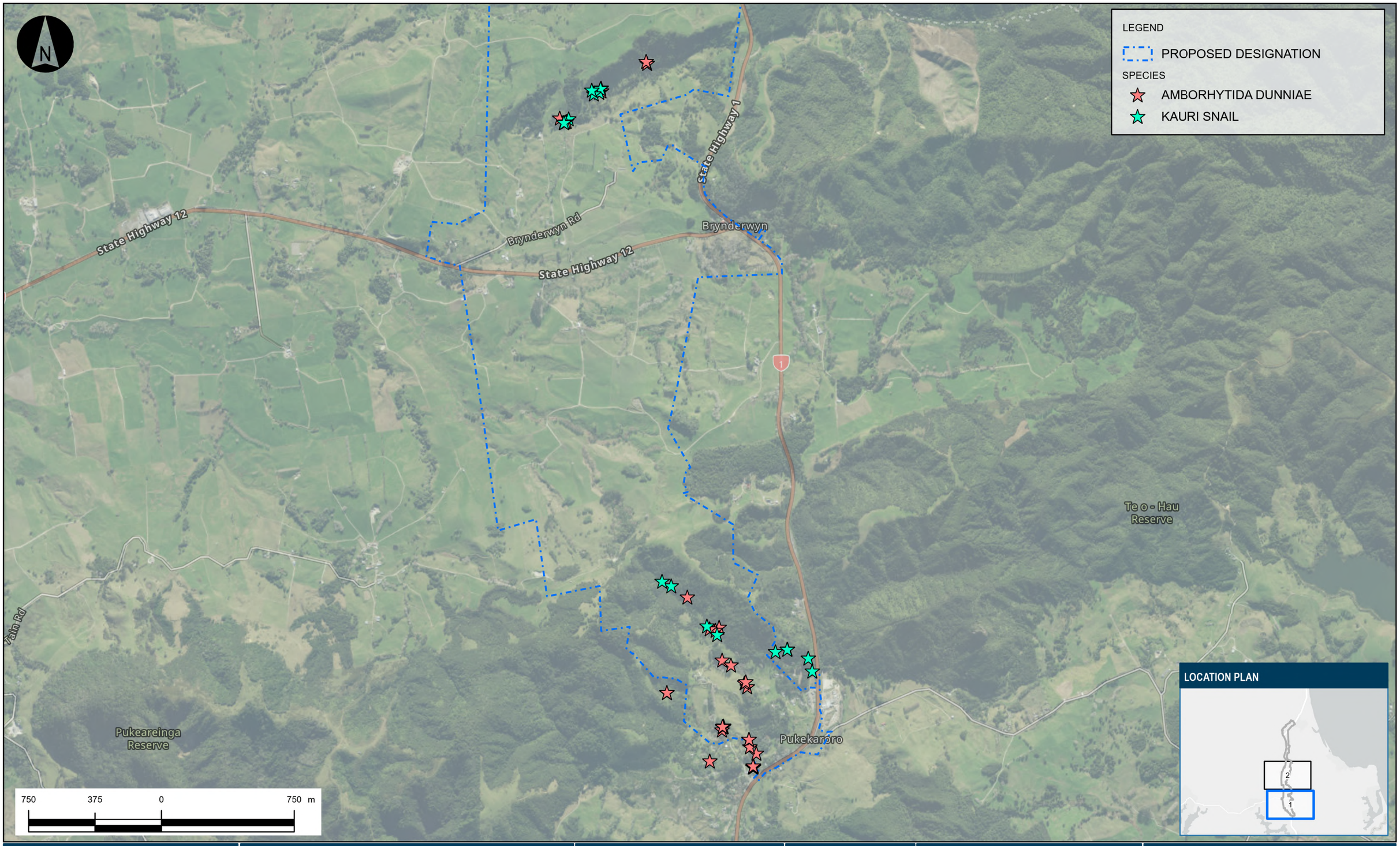


PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	10/12/2025	FOR INFORMATION	RDP
	B	10/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:20,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	J. WU	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	J. HIND	31/03/2026

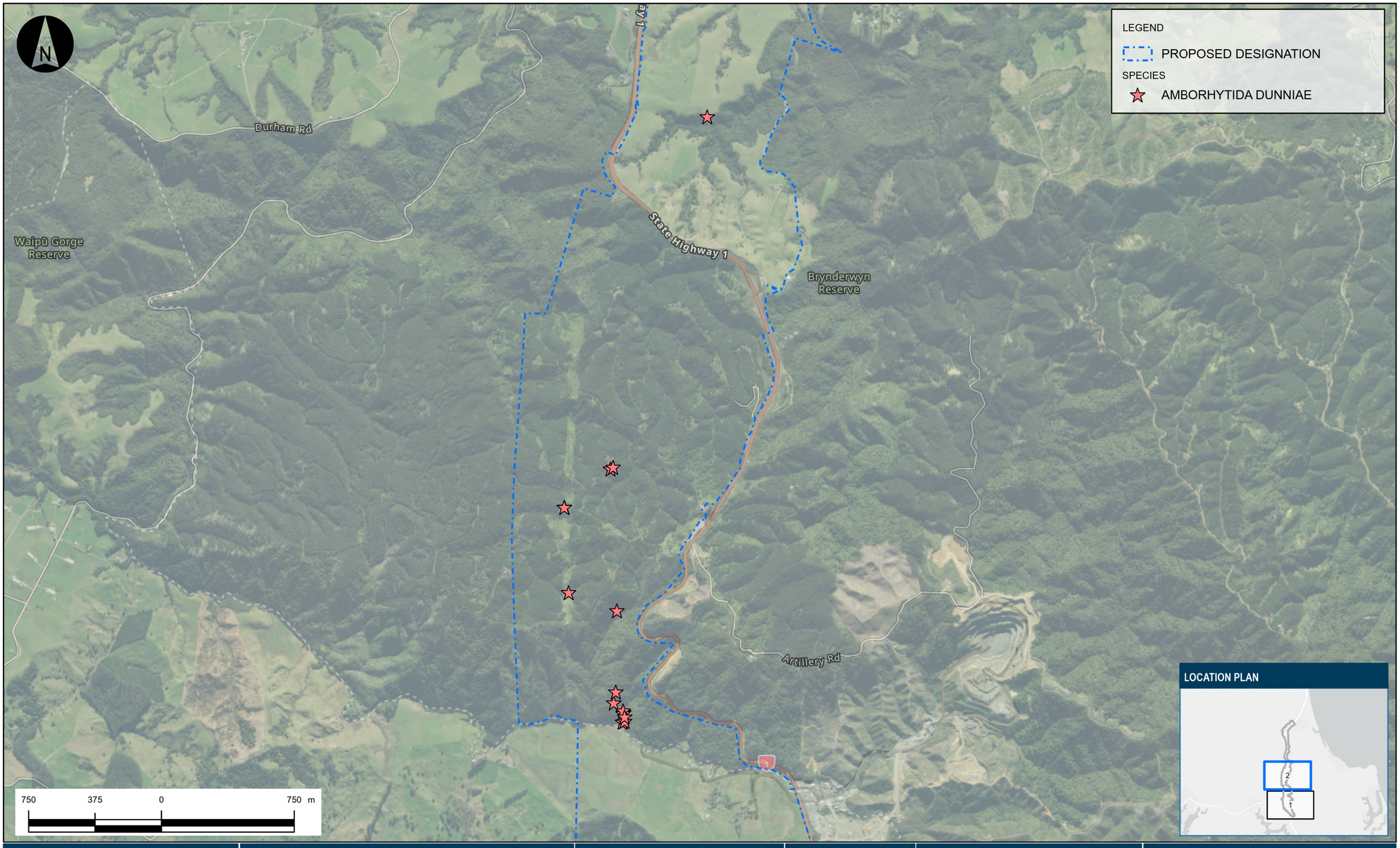
STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION
AT RISK SNAIL OBSERVATIONS
SHEET 1 OF 2

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1153			
SCALE	SIZE	REFERENCE NO.	REV
1:20,000	A3	PE-1153	C

Printed on 2026-Mar-31 at 6:13 pm | Drawn by: H.SANTOS | Original File: C:\Users\hse191\Documents\PROJECTS\Northland Corridor



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	10/12/2025	FOR INFORMATION	RDP
	B	10/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	31/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
SCALE: 1:20,000				
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	H. SANTOS	31/03/2026
CHECKED	J. WU	31/03/2026
REVIEWED	L. DENMEAD	31/03/2026
VERIFIED	L. DENMEAD	31/03/2026
PROJECT LEAD	J. HIND	31/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	31/03/2026

TITLE

BRYNDERWYN HILLS SECTION AT RISK SNAIL OBSERVATIONS SHEET 2 OF 2

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1154

SCALE	SIZE	REFERENCE NO.	REV
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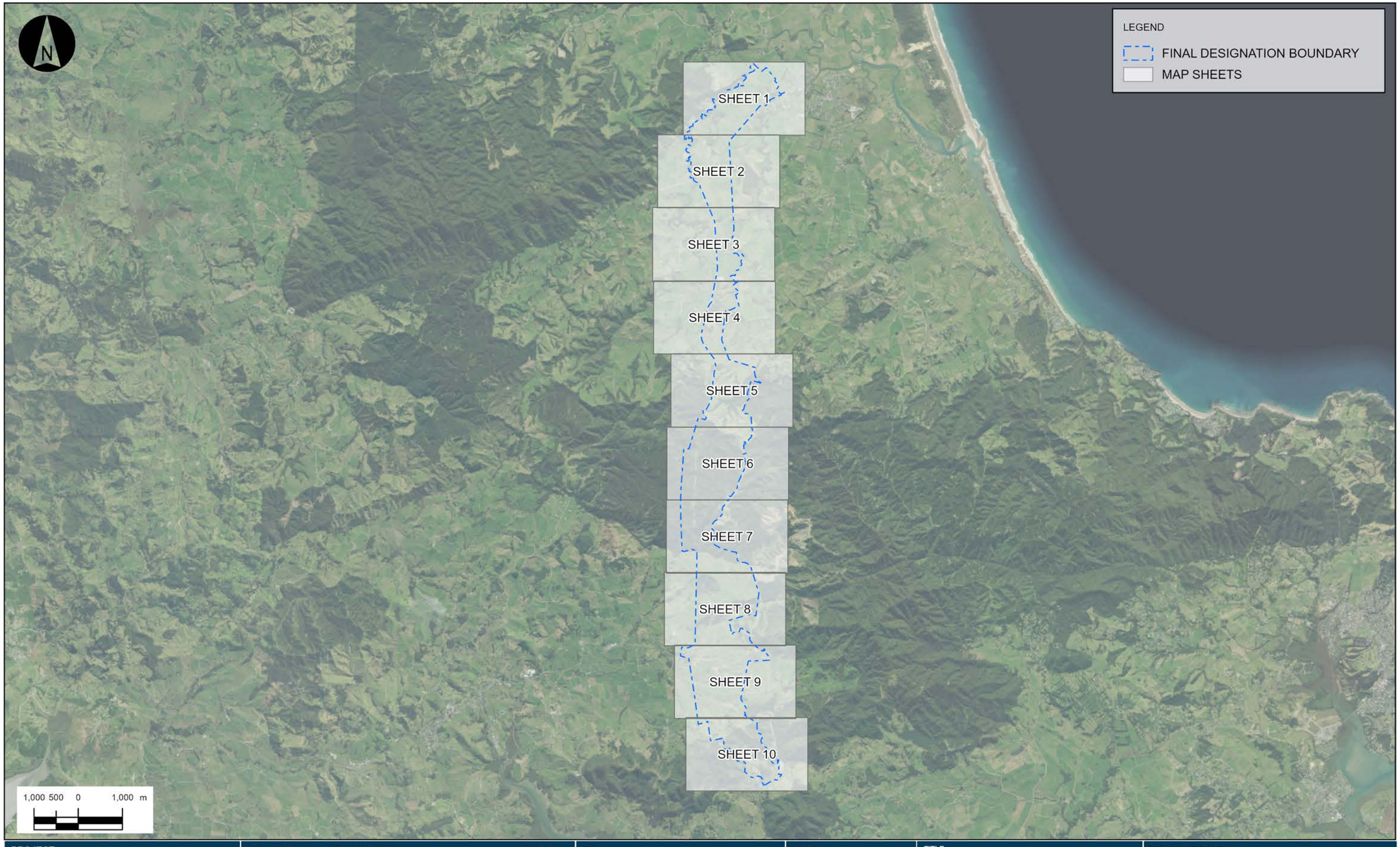
Printed on 2026-Mar-31 at 6:12 pm | Drawn by: H SANTOS | Original File: C:\Users\hsa191\Documents\PROJECTS\Northland Corridor

Appendix O
Map of Vegetation Values



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	27/03/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:80,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	27/03/2026
CHECKED	H. SANTOS	27/03/2026
REVIEWED	L. DENMEAD	27/03/2026
VERIFIED	H. SANTOS	27/03/2026
PROJECT LEAD	J. HIND	27/03/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	27/03/2026

TITLE

BRYNDERWYN HILLS SECTION VEGETATION AND BAT HABITAT OVERVIEW MAP

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1165

SCALE	SIZE	REFERENCE NO.	REV
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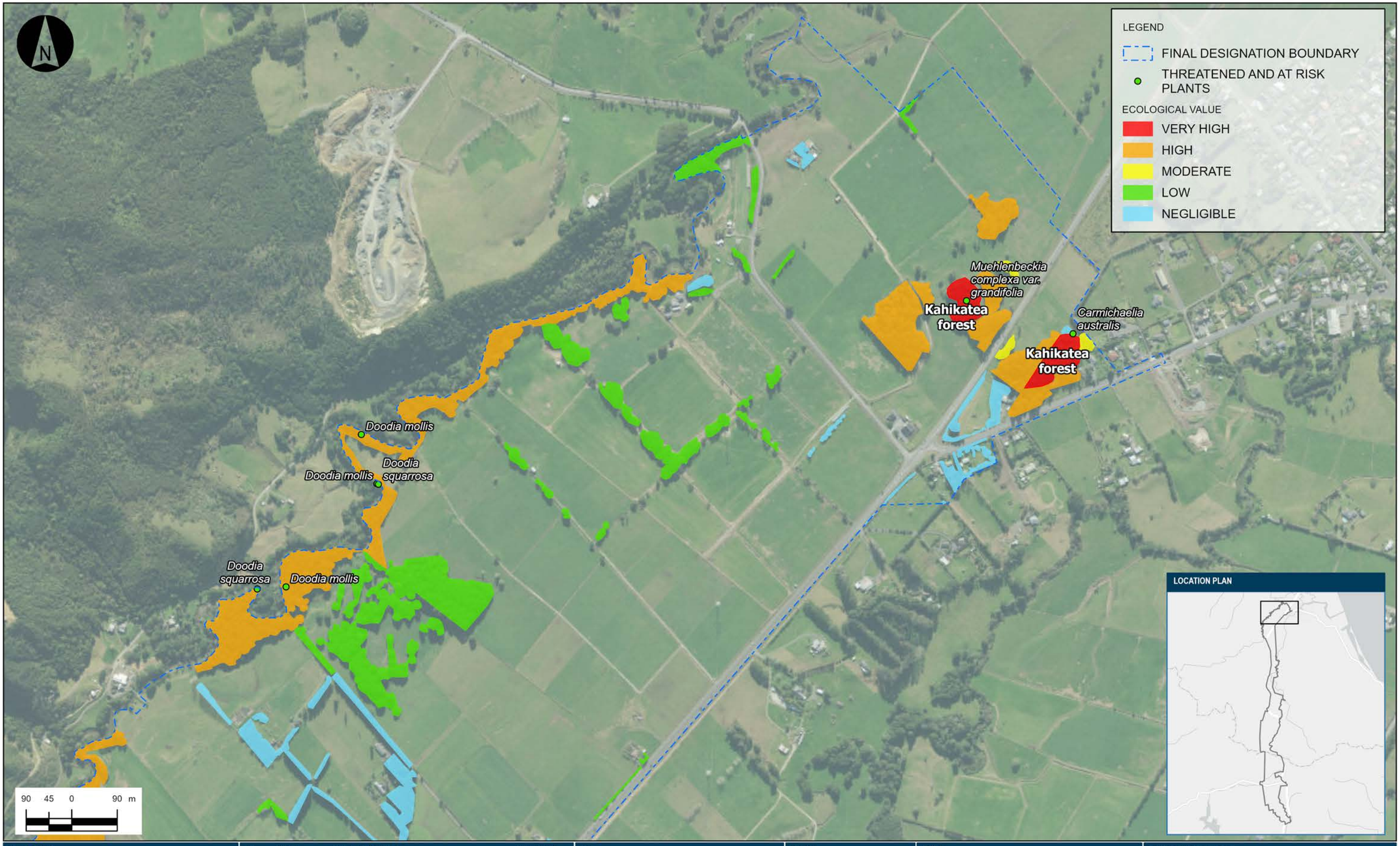

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 1 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1176

SCALE	SIZE	REFERENCE NO.	REV
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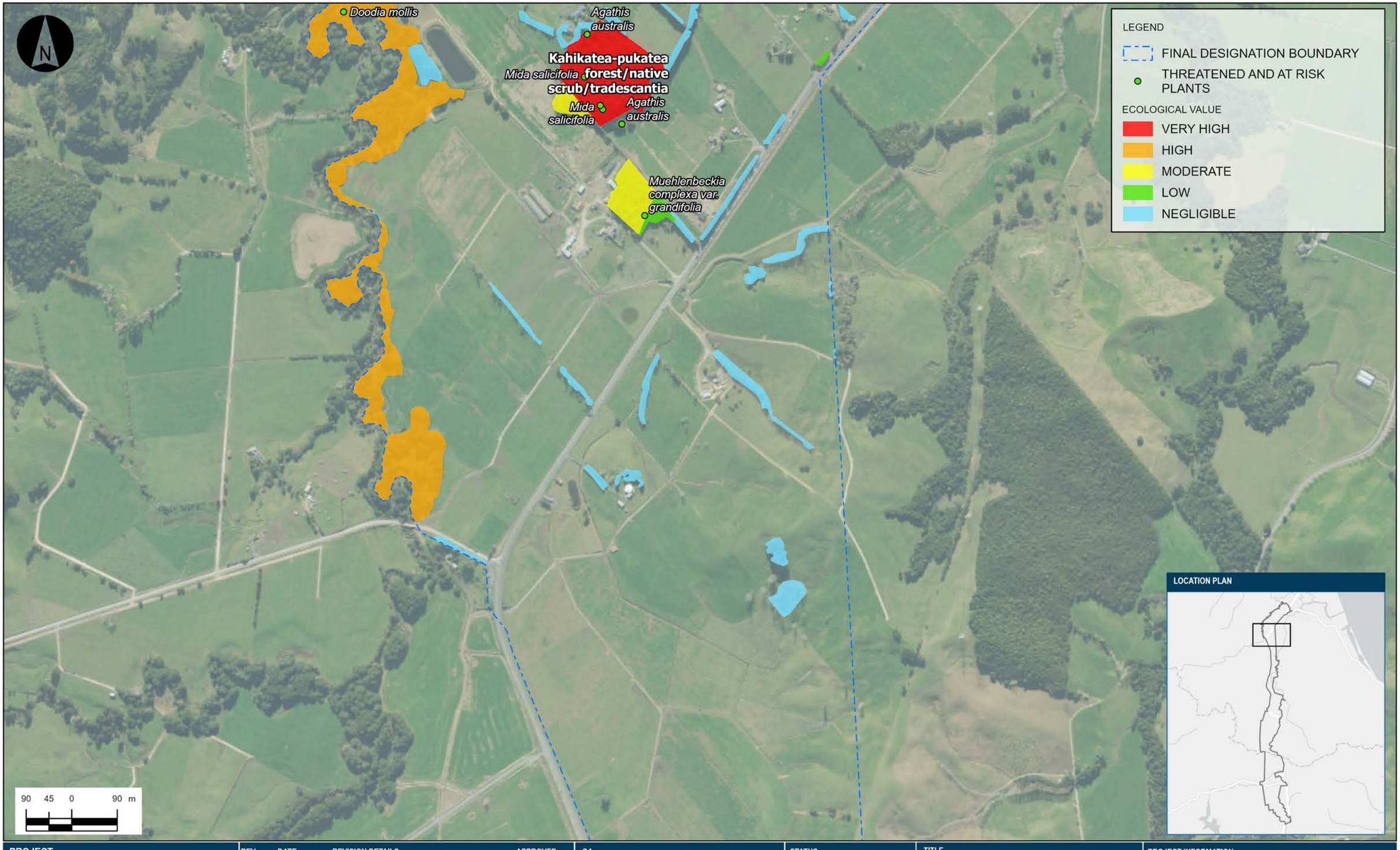

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 2 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1177

SCALE	SIZE	REFERENCE NO.	REV
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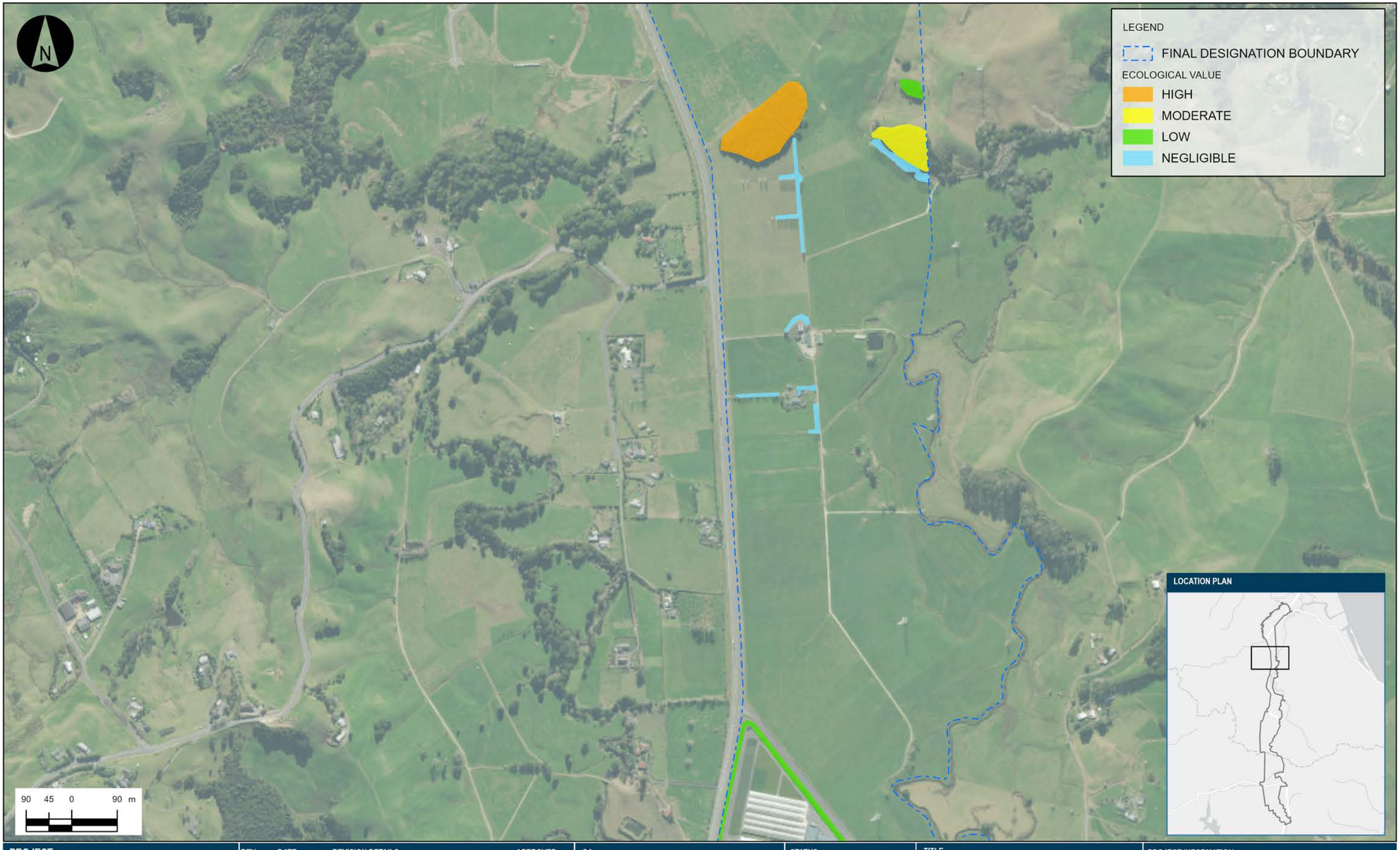

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 3 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1178

SCALE	SIZE	REFERENCE NO.	REV
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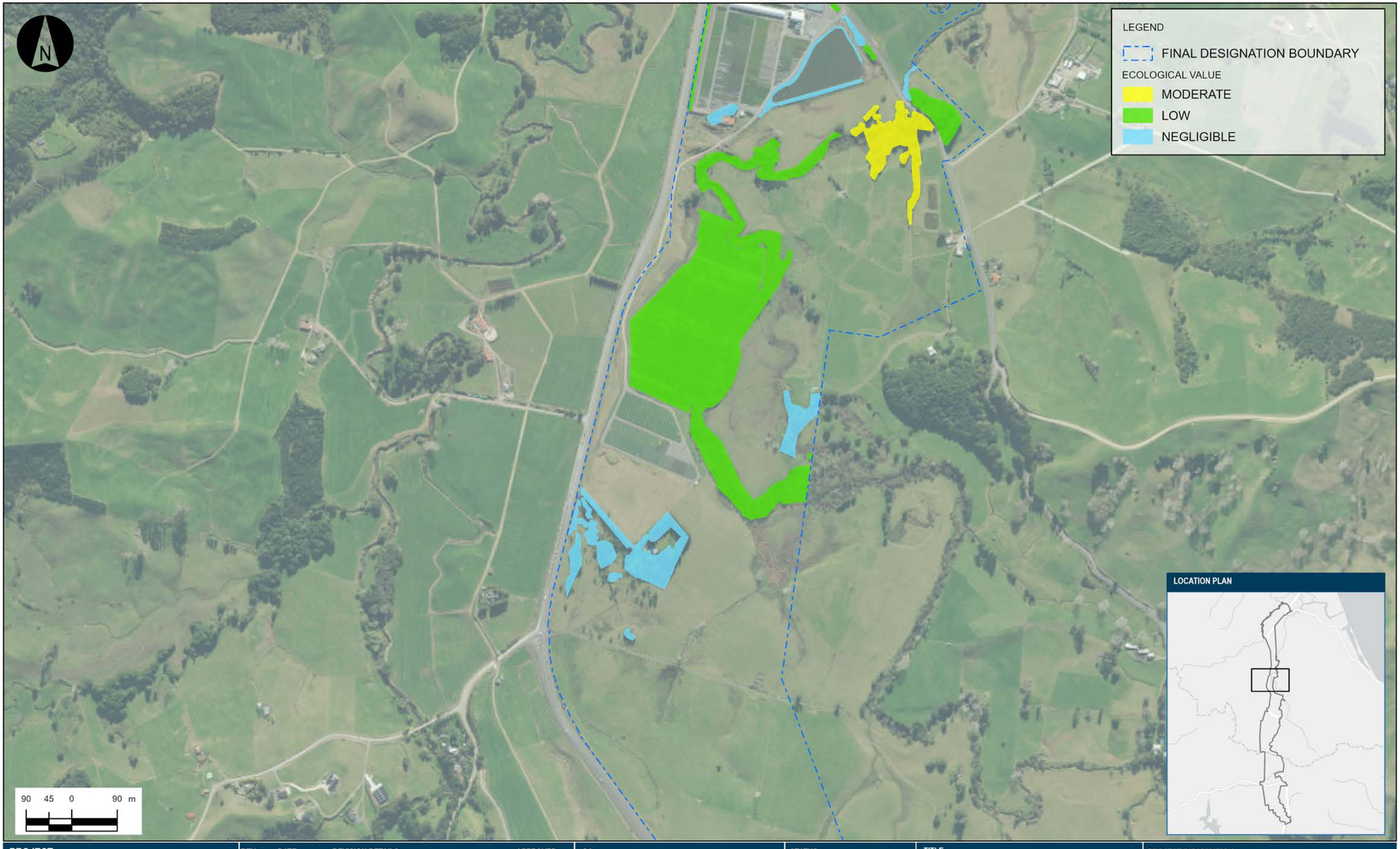

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 4 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1179

SCALE	SIZE	REFERENCE NO.	REV
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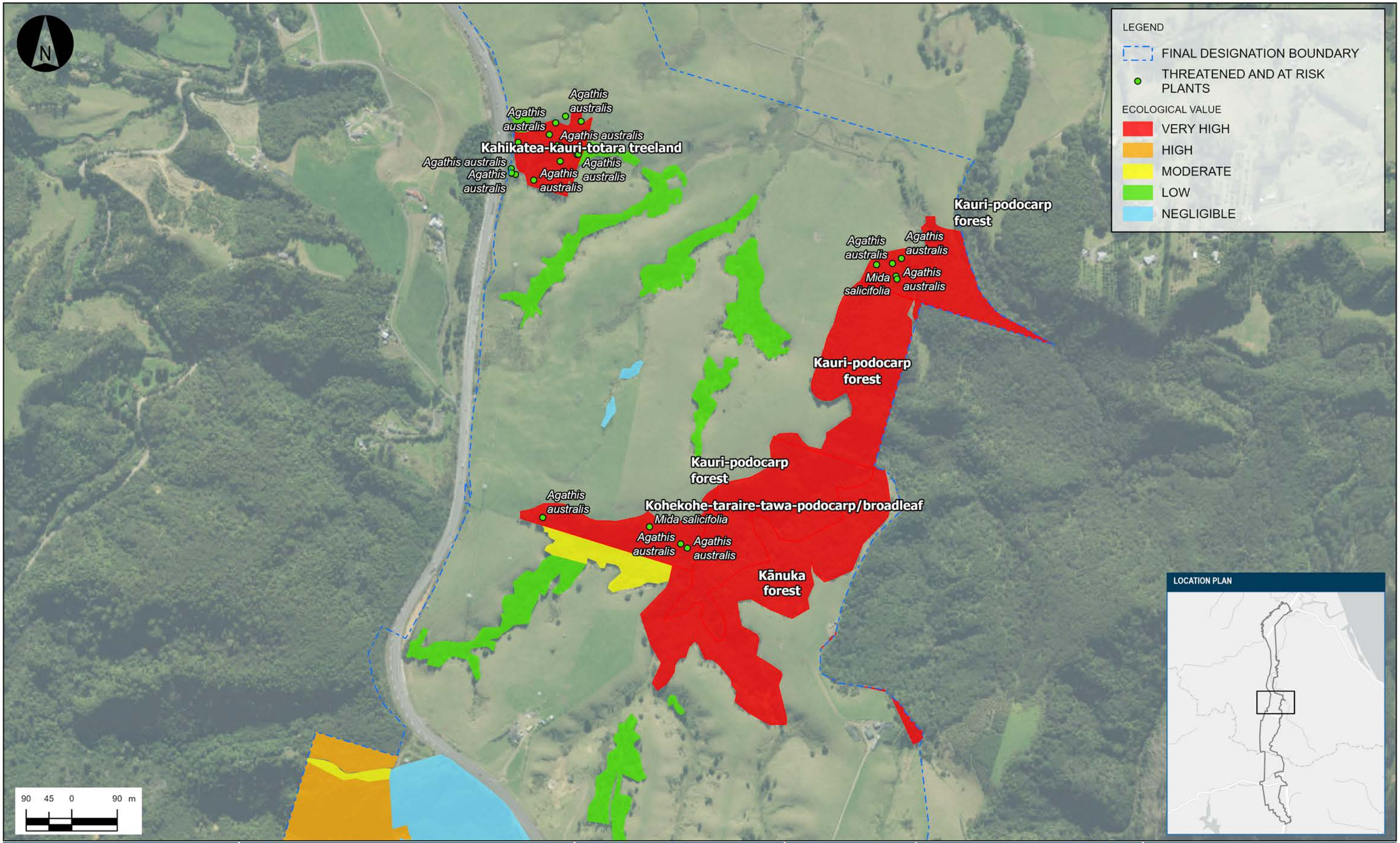

LOCATION PLAN

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 5 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1180

SCALE	SIZE	REFERENCE NO.	REV
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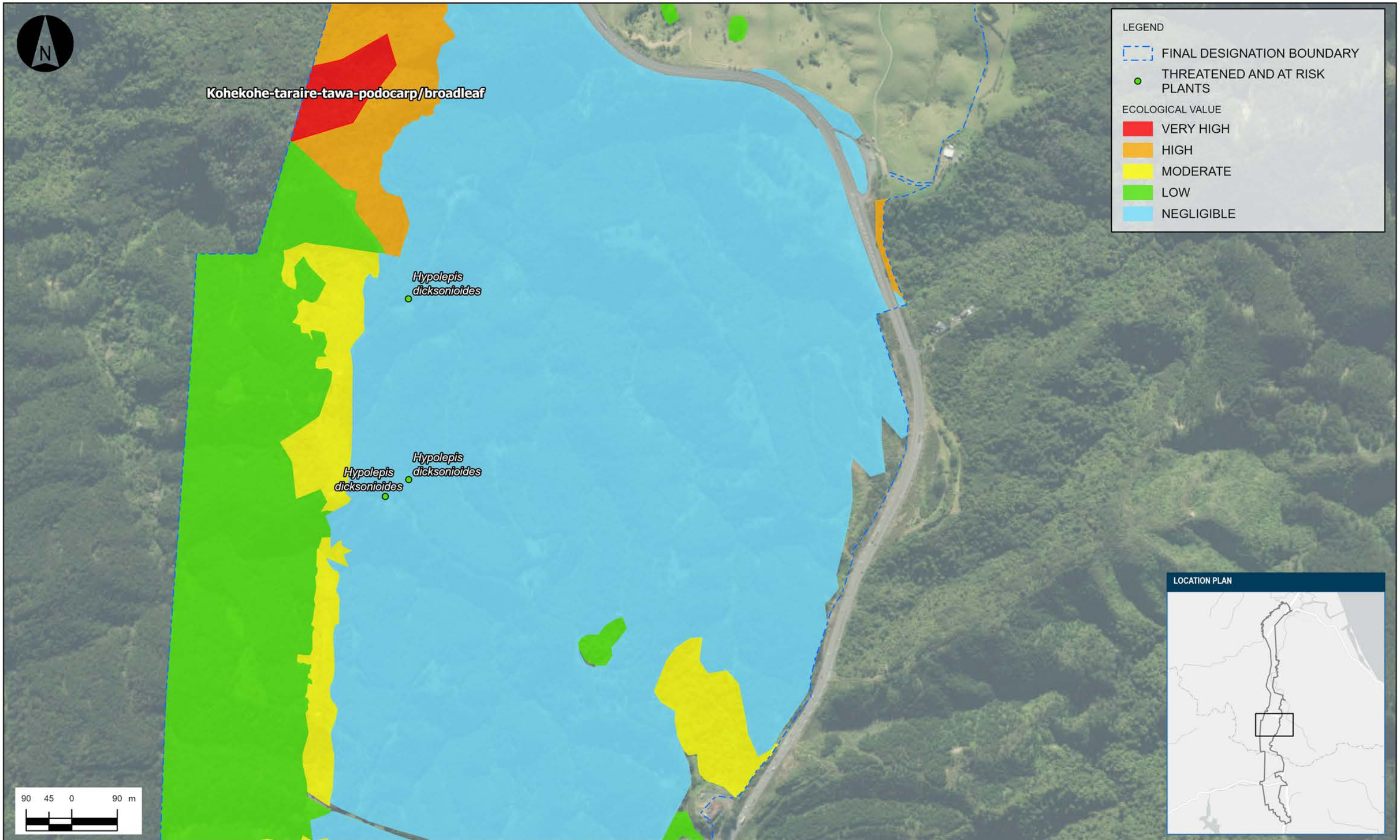

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 6 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1181

SCALE	SIZE	REFERENCE NO.	REV
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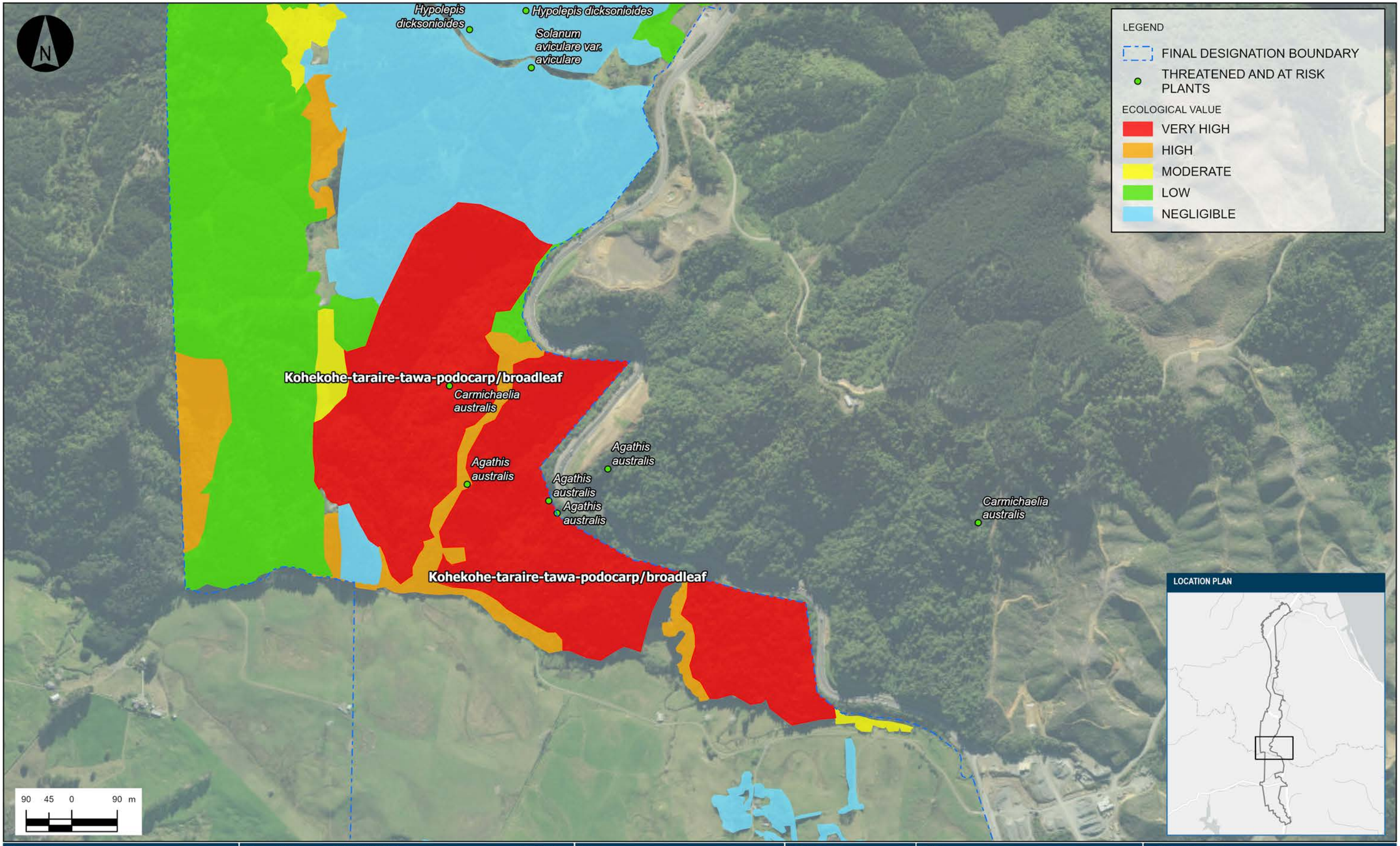

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 7 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1182

SCALE	SIZE	REFERENCE NO.	REV
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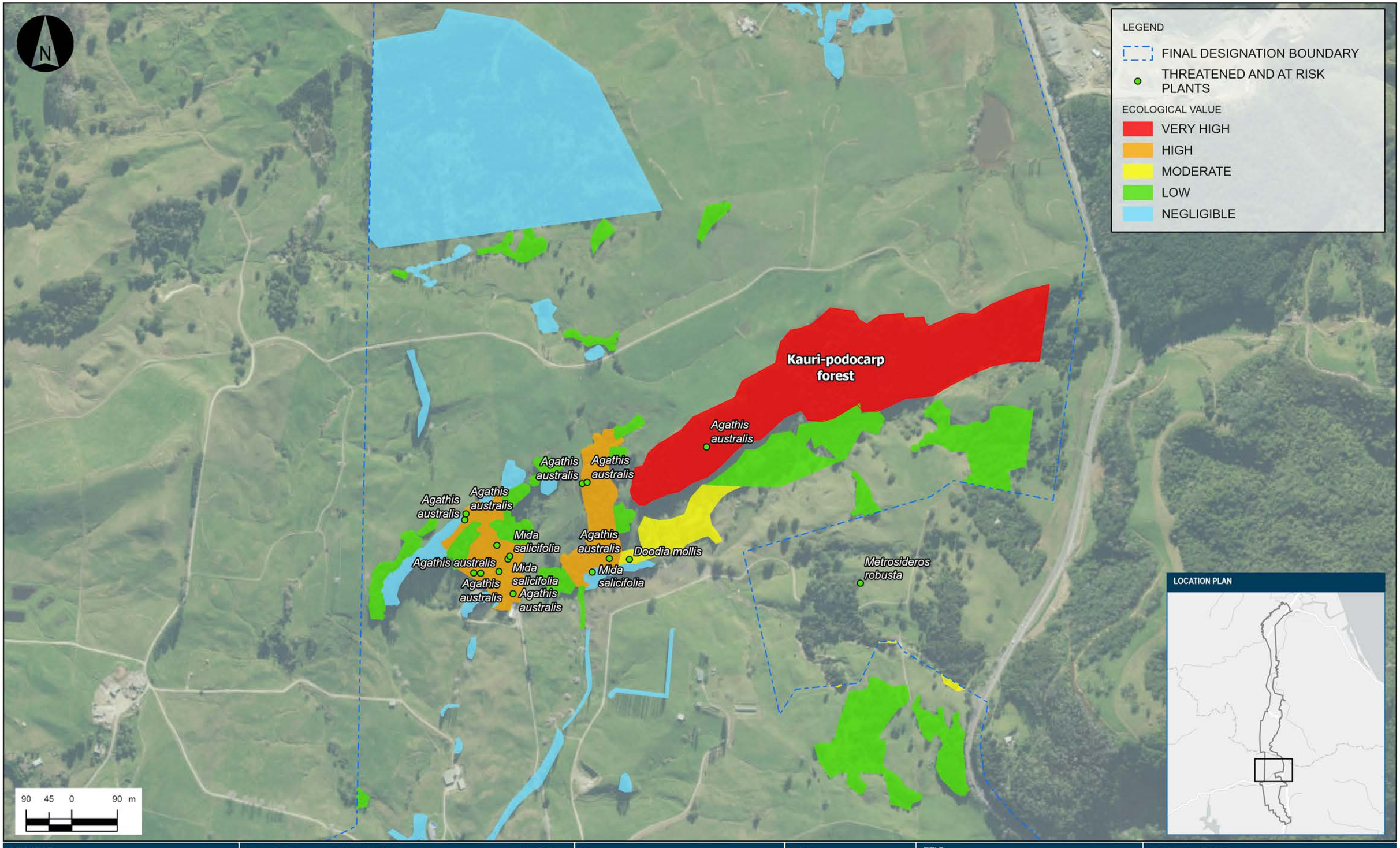

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 8 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1183

SCALE	SIZE	REFERENCE NO.	REV
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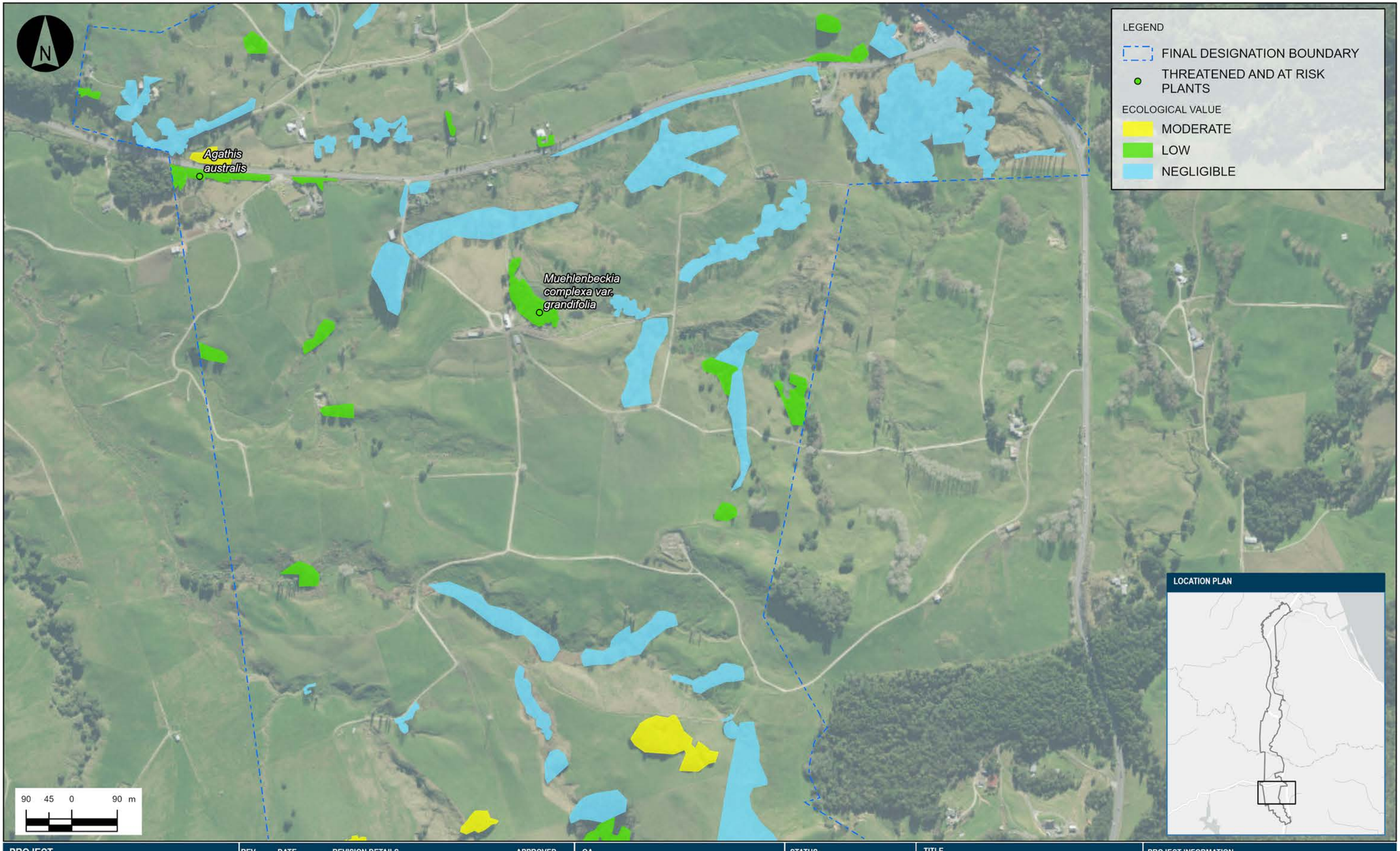


PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

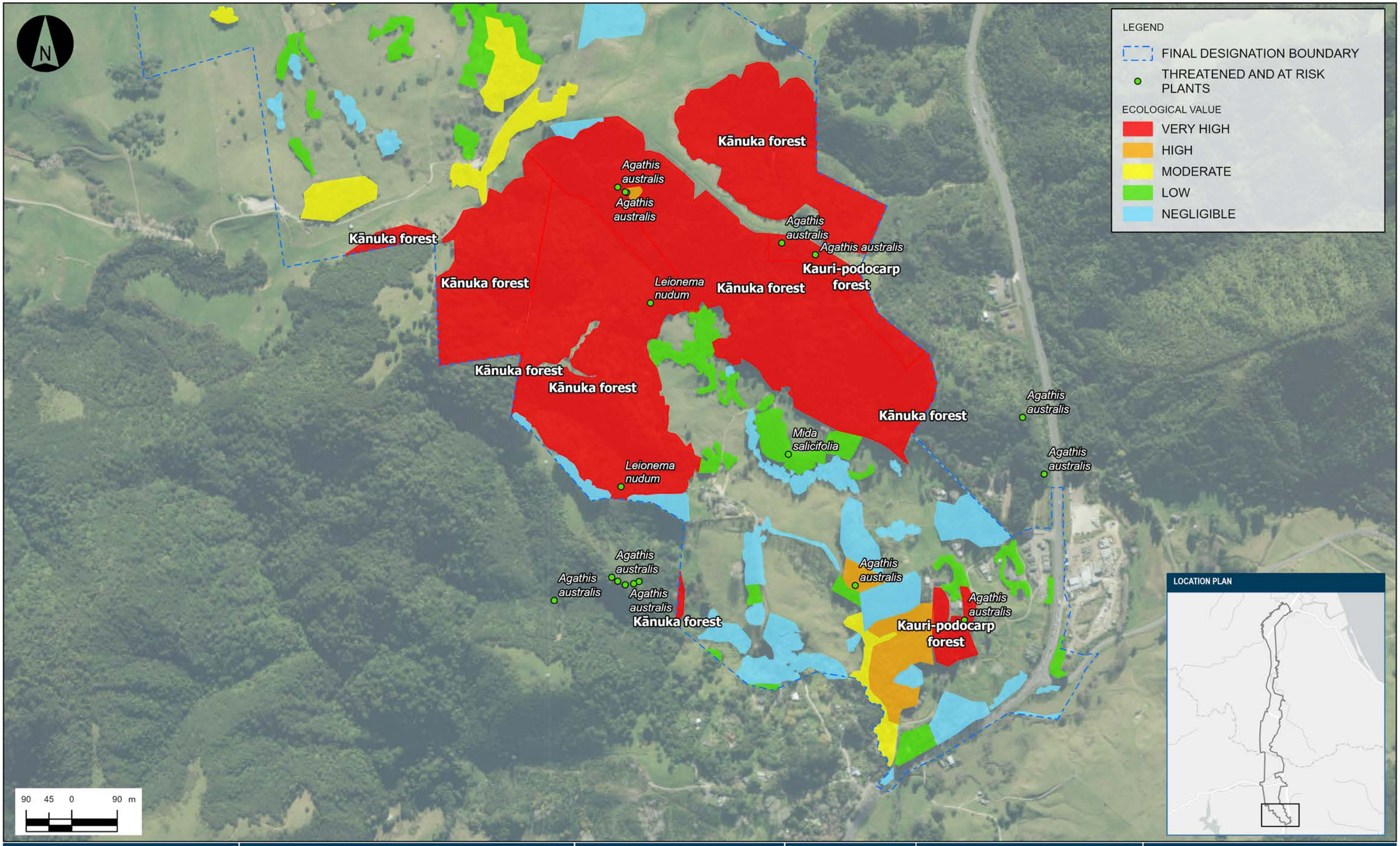
QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 9 OF 10

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1184			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1184	C



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	J. WU	1/04/2026
REVIEWED	L. DENMEAD	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

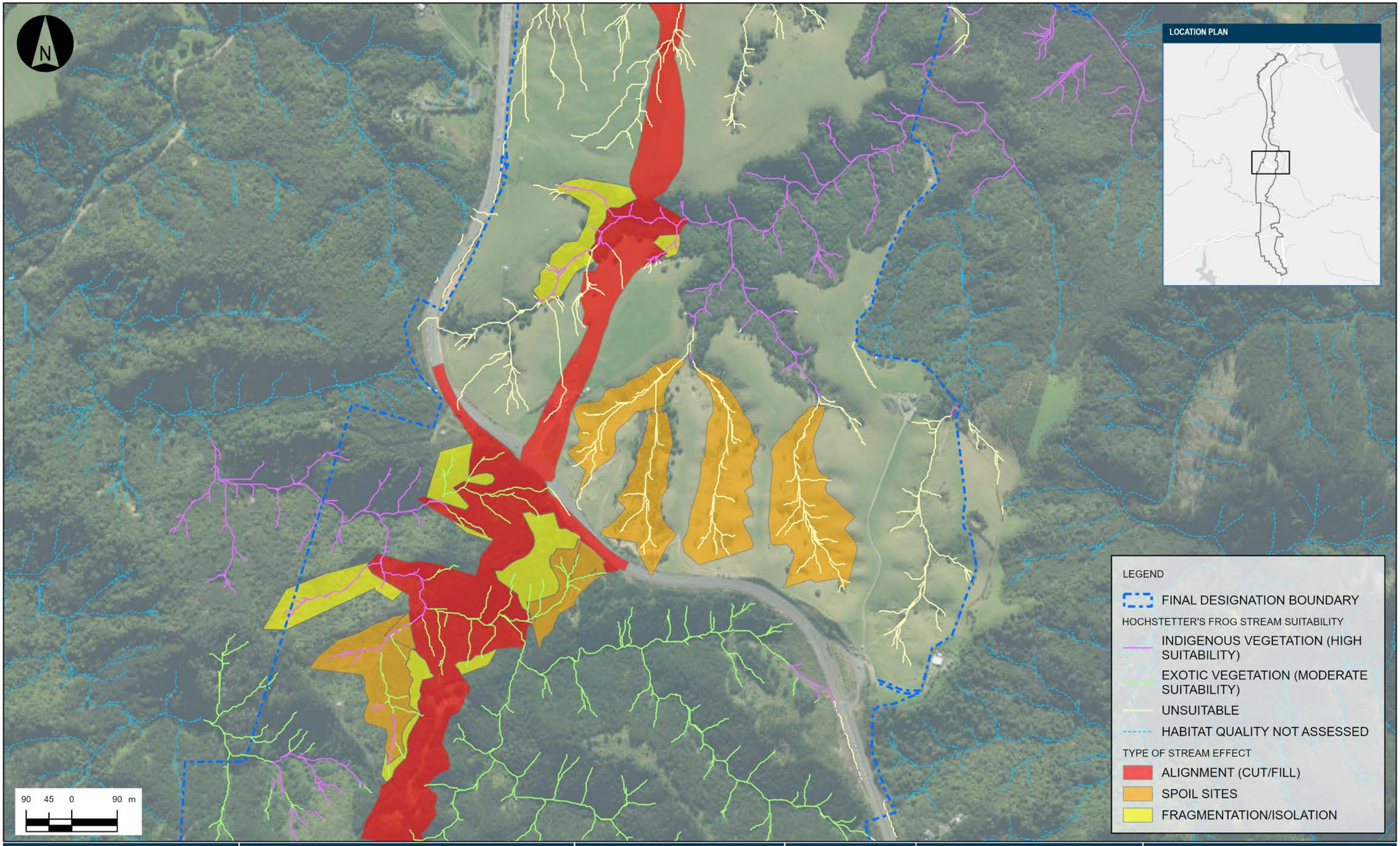
BRYNDERWYN HILLS SECTION
VEGETATION VALUES
SHEET 10 OF 10

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1185			
SCALE	SIZE	REFERENCE NO.	REV
1:7,000	A3	PE-1185	C

Appendix P
Map of Frog Stream Habitat Loss and Fragmentation of Habitat



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	30/03/2026	FOR INFORMATION	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
DIRECT LOSS AND FRAGMENTATION
EFFECTS ON FROG HABITAT
SHEET 1 OF 3

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1162			
SCALE	SIZE	REFERENCE NO.	REV
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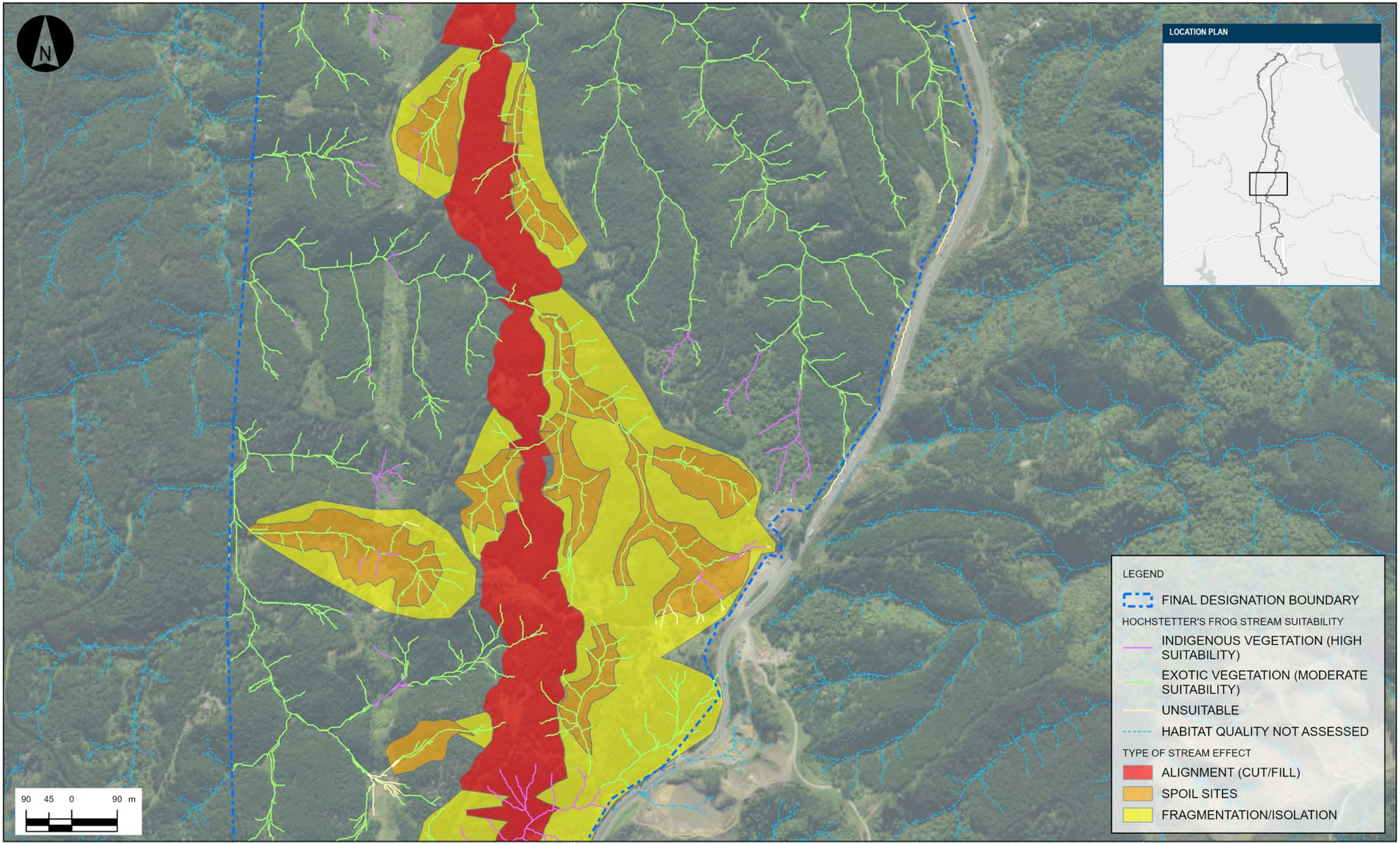

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	30/03/2026	FOR INFORMATION	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
DIRECT LOSS AND FRAGMENTATION EFFECTS ON FROG HABITAT
SHEET 2 OF 3

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
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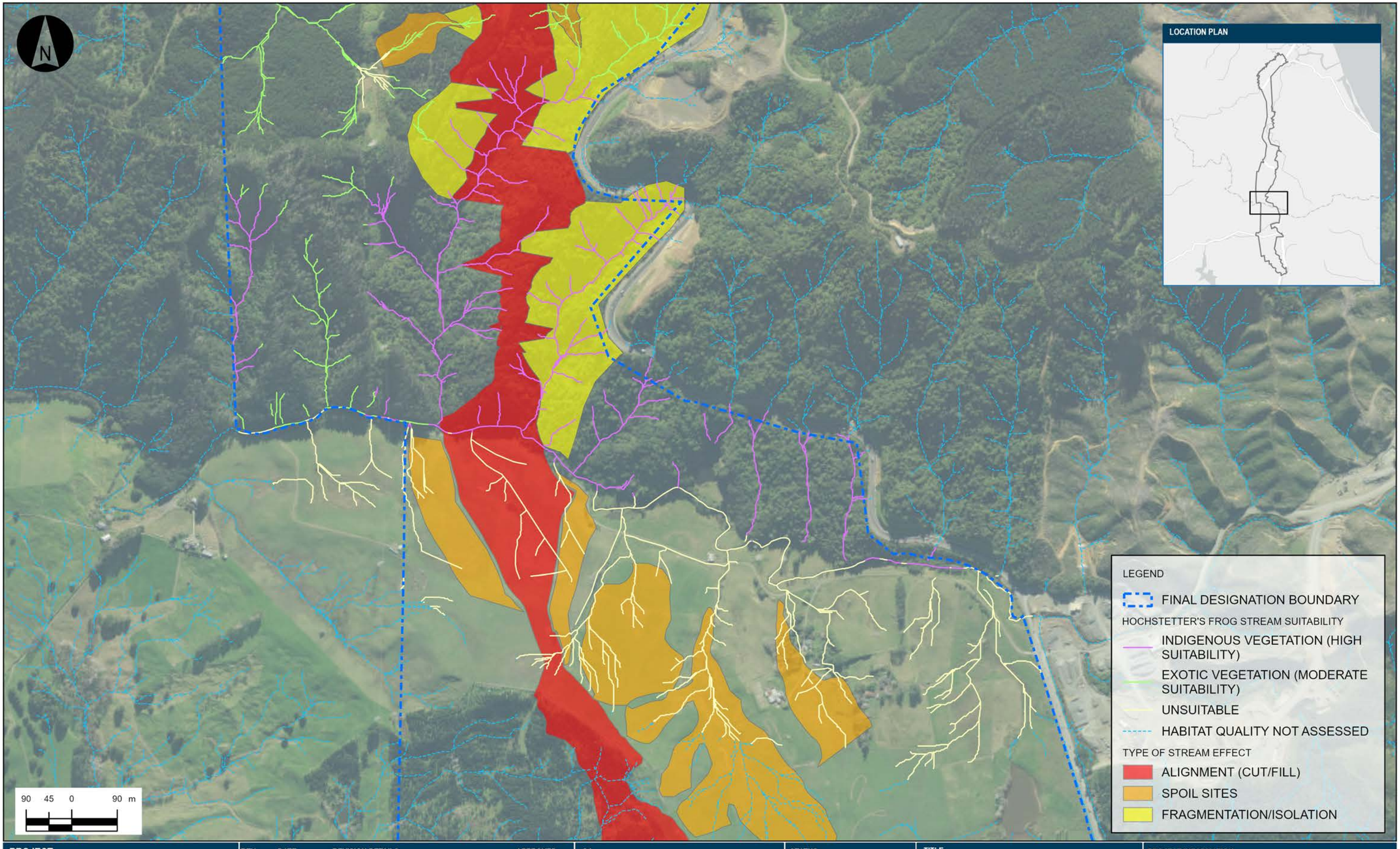

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	30/03/2026	FOR INFORMATION	RDP
SCALE: 1:7,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
DIRECT LOSS AND FRAGMENTATION EFFECTS ON FROG HABITAT
SHEET 3 OF 3

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1164			
SCALE	SIZE	REFERENCE NO.	REV
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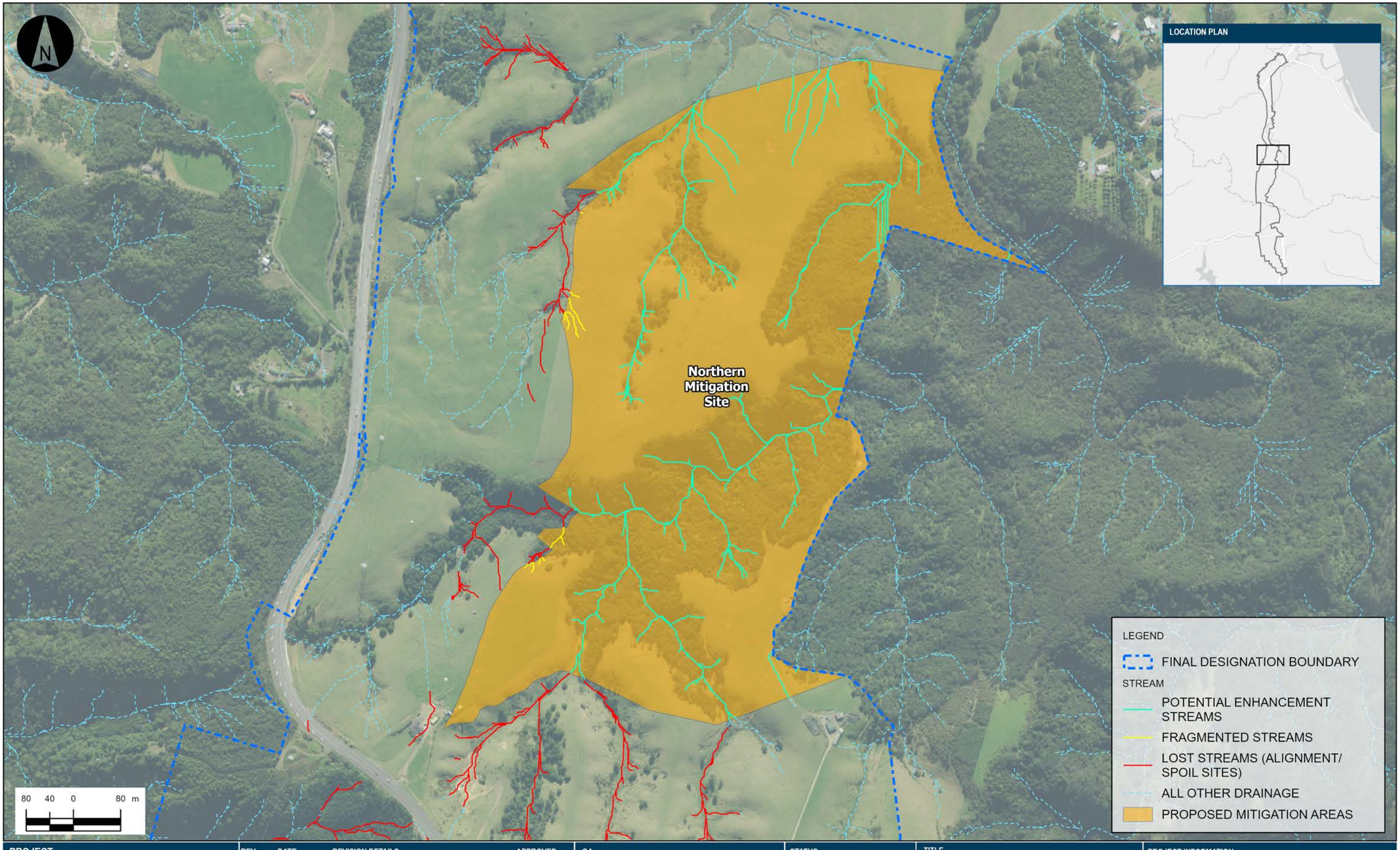
Appendix Q
Potential Streams for Frog Release and Habitat Enhancement at Indicative Mitigation Sites



PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ Transport Agency Waka Kotahi — Northland Corridor — Roads of National Significance	A	1/04/2026	FOR INFORMATION	RDP
SCALE: 1:6,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
POTENTIAL STREAMS FOR FROG HABITAT ENHANCEMENT
SHEET 1 OF 2

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1148			
SCALE	SIZE	REFERENCE NO.	REV
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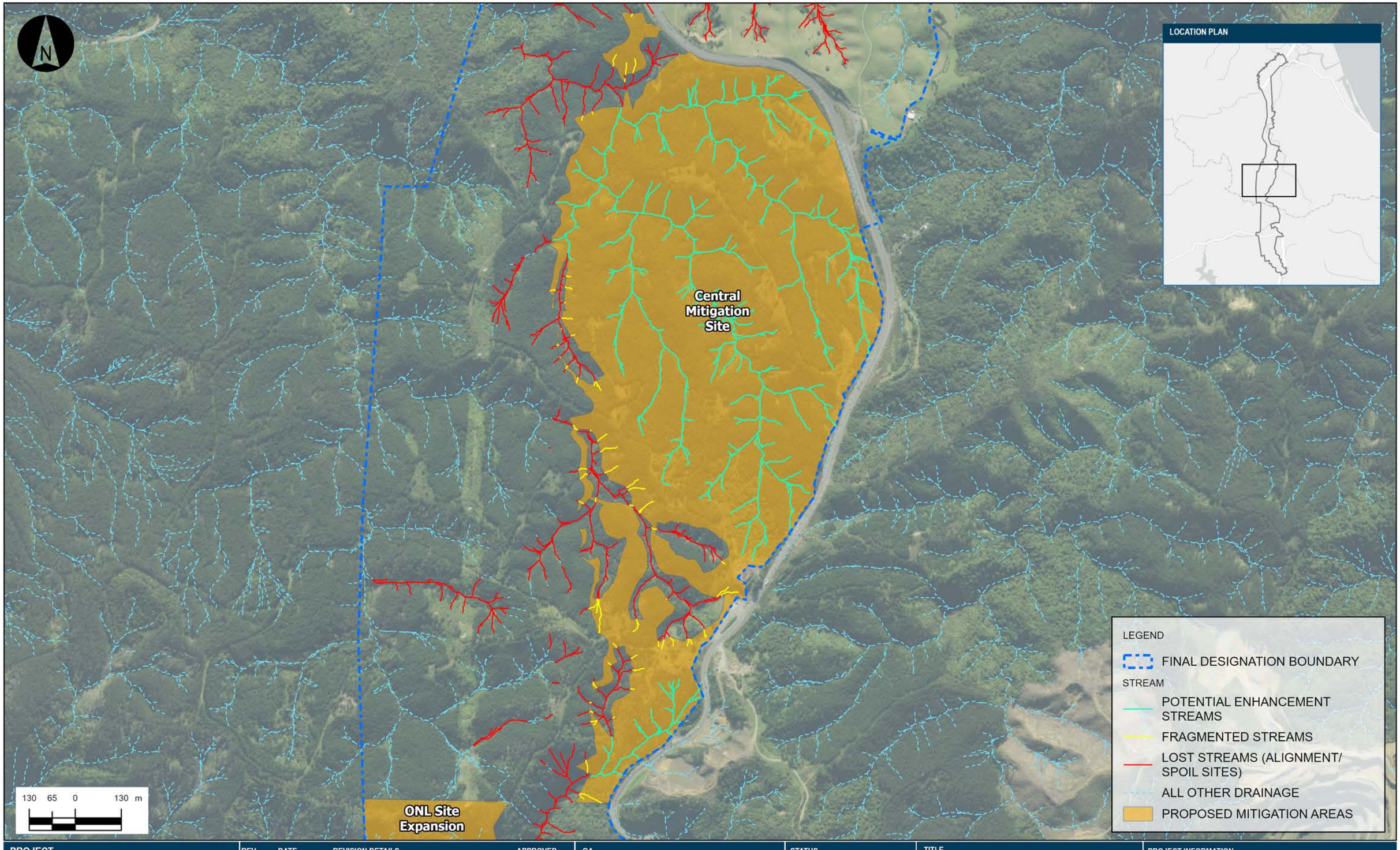

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	1/04/2026	FOR INFORMATION	RDP
SCALE: 1:10,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
POTENTIAL STREAMS FOR FROG HABITAT ENHANCEMENT
SHEET 2 OF 2

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1149			
SCALE	SIZE	REFERENCE NO.	REV
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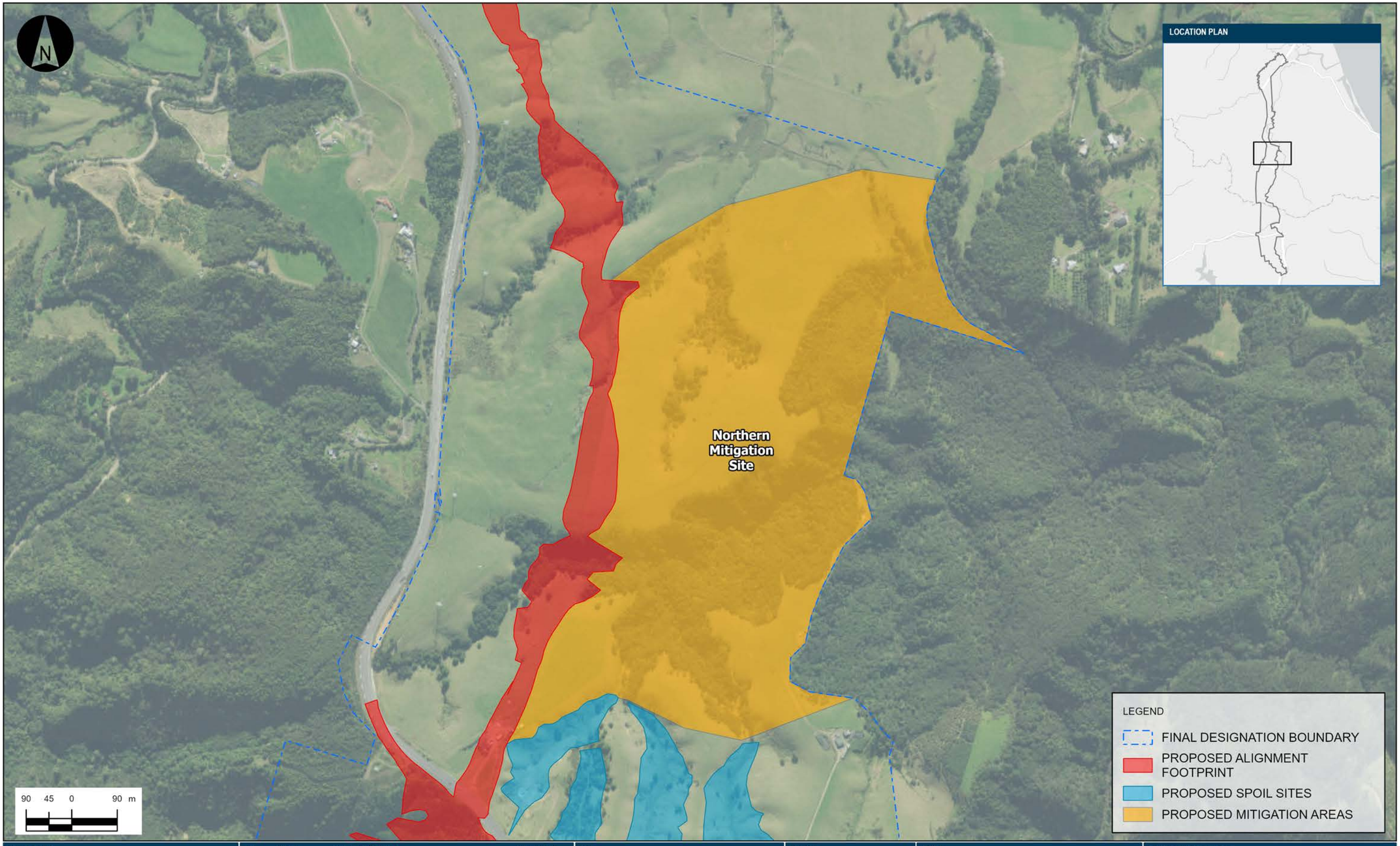
Appendix R
Proposed Mitigation and Release Sites



PROJECT

NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	23/01/2026	FOR INFORMATION	RDP
B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	5/03/2026	ADDED ADDITIONAL MITIGATION SITES	RDP
D	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
E	1/04/2026	NORTHERN SITE SHAPE AND SIZE REVISION	RDP

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS

FOR INFORMATION

APPROVED

R. DU PLOOY

APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
PROPOSED MITIGATION AND RELEASE SITES
SHEET 1 OF 4

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1197

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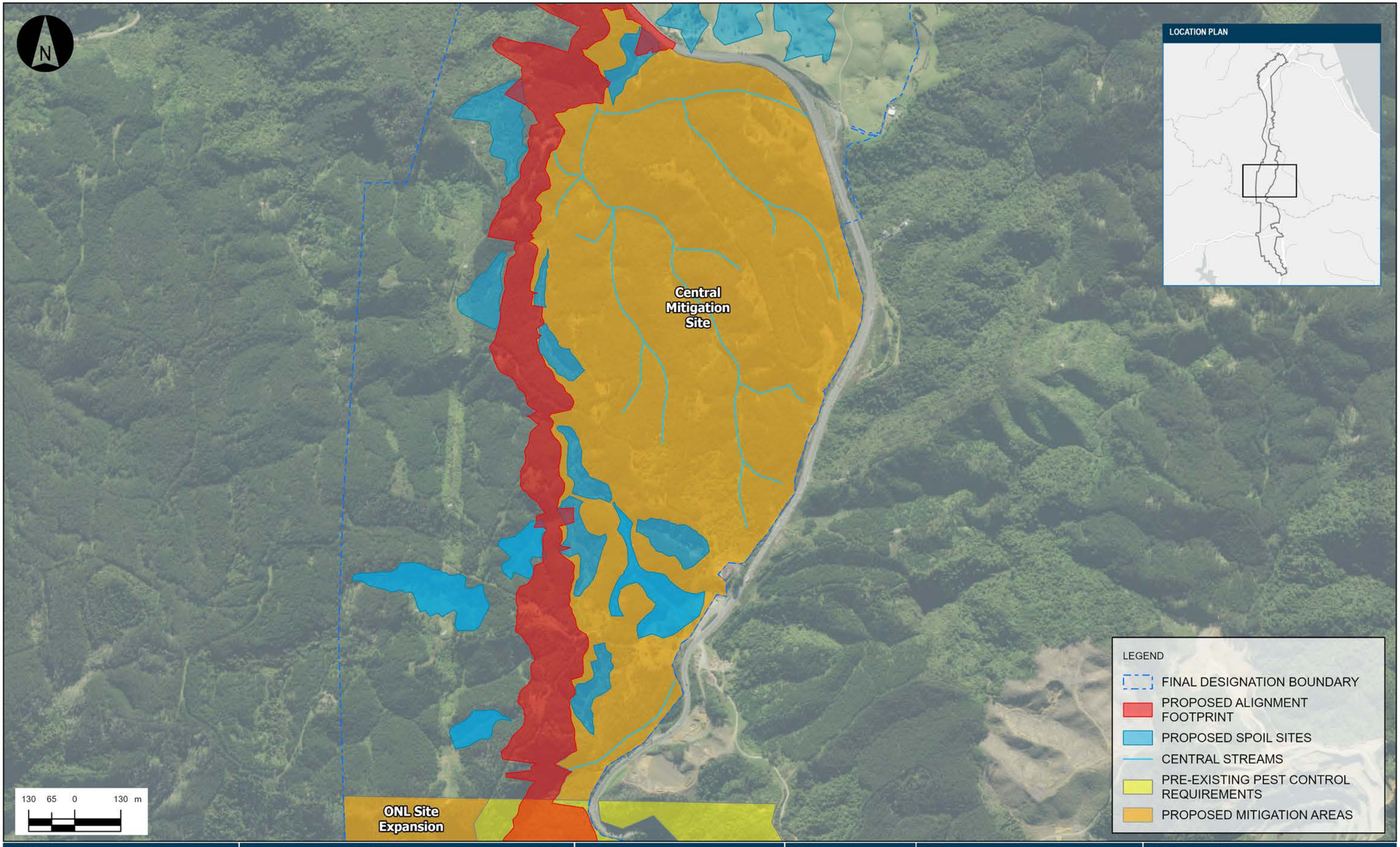

PROJECT	REV	DATE	REVISION DETAILS	APPROVED
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance	A	23/01/2026	FOR INFORMATION	RDP
	B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
	C	5/03/2026	ADDED ADDITIONAL MITIGATION SITES	RDP
	D	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
	E	1/04/2026	NORTHERN SITE SHAPE AND SIZE REVISION	RDP
SCALE: 1:10,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator				

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
PROPOSED MITIGATION AND RELEASE SITES
SHEET 2 OF 4

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE

10722-PTA-2B0-PE-DRG-1198

SCALE	SIZE	REFERENCE NO.	REV
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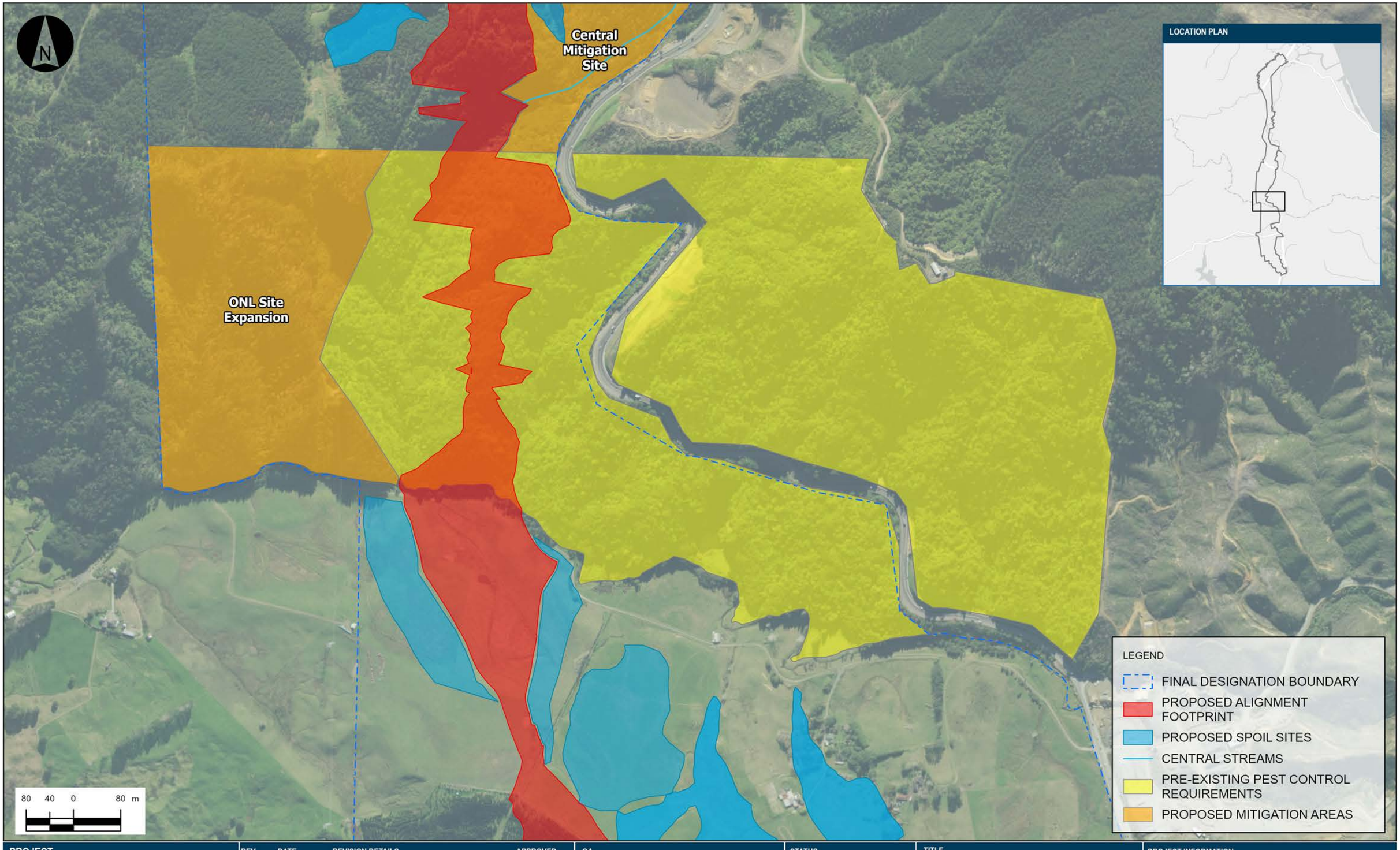

PROJECT
NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance
SCALE: 1:6,000 COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	23/01/2026	FOR INFORMATION	RDP
B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	5/03/2026	ADDED ADDITIONAL MITIGATION SITES	RDP
D	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
E	1/04/2026	NORTHERN SITE SHAPE AND SIZE REVISION	RDP

QA		
DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS	
FOR INFORMATION	
APPROVED	
R. DU PLOOY	
APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
PROPOSED MITIGATION AND RELEASE SITES
SHEET 3 OF 4

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-PE-DRG-1199			
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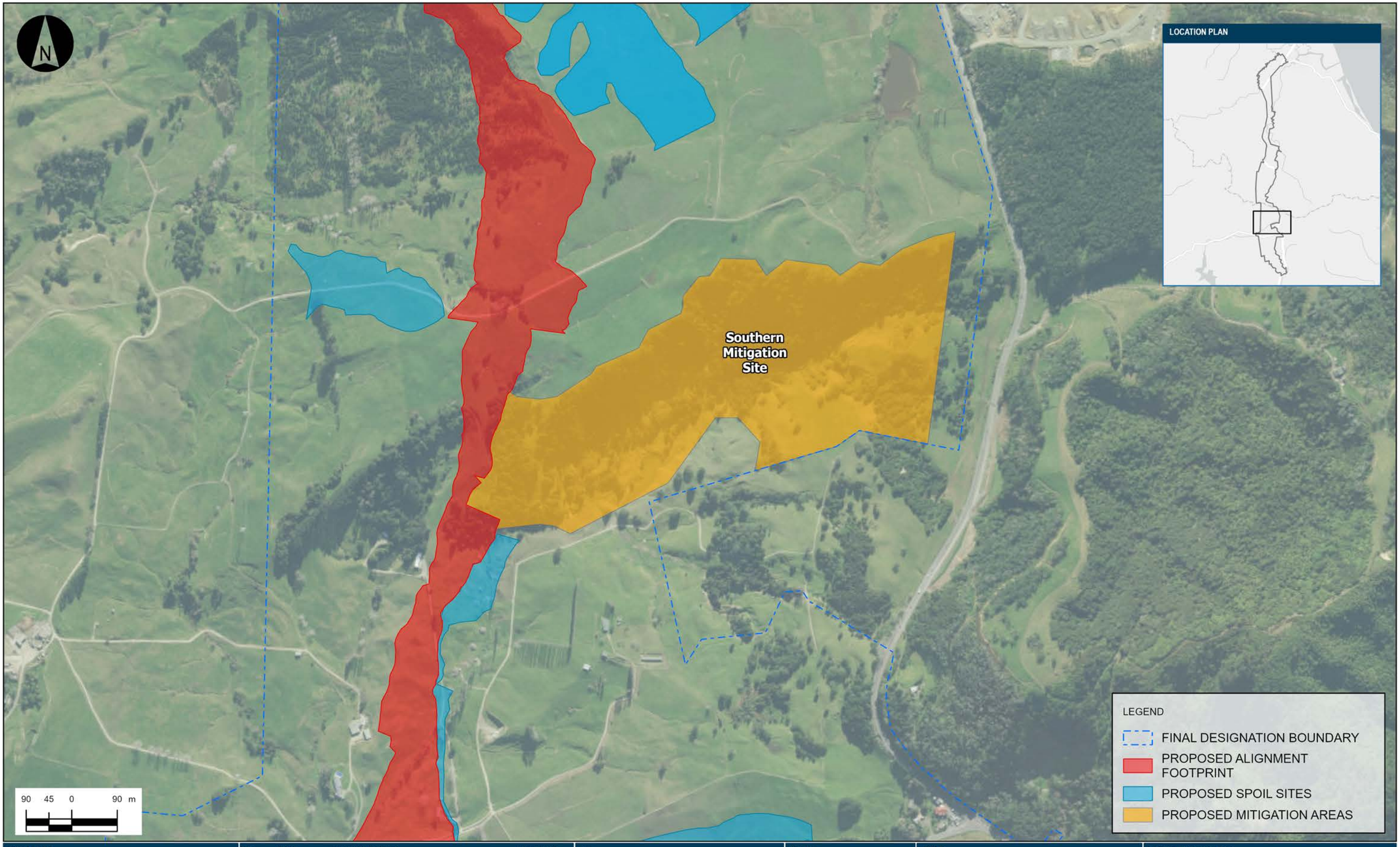

PROJECT

NZ TRANSPORT AGENCY WAKA KOTAHI — Northland Corridor — Roads of National Significance

SCALE: 1:7,000
COORDINATE SYSTEM: NZGD 2000 New Zealand Transverse Mercator

REV	DATE	REVISION DETAILS	APPROVED
A	23/01/2026	FOR INFORMATION	RDP
B	02/03/2026	UPDATED WITH FINAL DESIGNATION BOUNDARY	RDP
C	5/03/2026	ADDED ADDITIONAL MITIGATION SITES	RDP
D	1/04/2026	MINOR UPDATE TO DESIGNATION BOUNDARY	RDP
E	1/04/2026	NORTHERN SITE SHAPE AND SIZE REVISION	RDP

QA

DRAWN	J. STEWART	1/04/2026
CHECKED	M. MADSEN	1/04/2026
REVIEWED	S. CHAPMAN	1/04/2026
VERIFIED	L. DENMEAD	1/04/2026
PROJECT LEAD	J. HIND	1/04/2026

STATUS

FOR INFORMATION

APPROVED: R. DU PLOOY

APPROVED BY	DATE
R. DU PLOOY	1/04/2026

TITLE

BRYNDERWYN HILLS SECTION
PROPOSED MITIGATION AND RELEASE SITES
SHEET 4 OF 4

PROJECT INFORMATION

NORTHLAND CORRIDOR

DOCUMENT CODE: 10722-PTA-2B0-PE-DRG-1200

SCALE	SIZE	REFERENCE NO.	REV
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